. OF .

Pittsburg Academy of Medicine.

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Dr Jinelle's Heirs

No. .....

To restore Insensation

℞ Balsami Copaiba ——— ℥j
Gum Arab ——— ℥iij
Sacch q.s. ft emulsio,
adde aqua cinnamomi,
Mist camph. utriusque ℥ij
page 60

Stimulating ointment in Ascites
Equal parts of ointments of iodine,
mercurial, and cantharides, page 64

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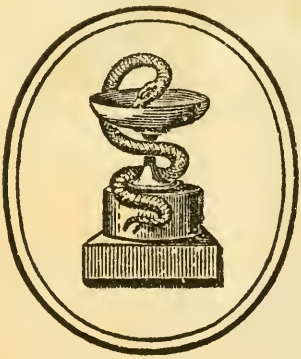
MEDICAL AND SURGICAL

MONOGRAPHS,

BY

DR. J. CLENDINNING, SIR A. COOPER, MR. W. COULSON, DR. ROBLEY DUNGLISON, DR. J. OSBORNE, DR. R. ROWLAND, AND MR J. SYME.



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ON

DISEASES OF THE RECTUM.

BY JAMES SYME, F. R. S. E.

PROFESSOR OF CLINICAL SURGERY IN THE UNIVERSITY OF EDINBURGH.

PREFACE.

The diseases of the rectum are very frequent in their occurrence, and derive additional interest, from the distressing symptoms which they occasion, as well as the relief of which they admit from the resources of surgical art. It may be added, that the mystery and concealment connected with their situation not only favour the deceptions of empirical practitioners, but also encourage the proceedings of wrong-headed operators, who prefer the most painful and dangerous means of treatment to those which are easy and safe.

On these accounts, it is desirable that this department of surgery should be thoroughly understood by the members of the profession, and that its leading principles should be placed prominently before them. The diseases of the rectum have accordingly been made the subject of many treatises, expressly devoted to their consideration, and it may seem unnecessary for me to increase the number of these productions. But the progress of modern pathology and surgical practice has introduced many improvements that have not yet been fairly brought together, and explained in their application to the management of those complaints which are at present more particularly in view. I have attempted to supply this defect; and, by a plain statement of the seat, nature, symptoms, and treatment of the different affections which are met with at the extremity of the rectum, endeavoured to assist practitioners in discharging their duty to the patient, and to protect patients against unprincipled or reckless practitioners.

It was not my wish to criticise the writers who have preceded me; and I have not done so, except on one or two occasions, where it seemed necessary, in order to explain my own meaning. From unwillingness to extend the limits of the treatise, I have not related detailed cases; but I may assure the reader that there is nothing stated which does not rest upon my own observation.

9, *Charlotte square*, *November*, 1837.

CHAPTER I.

FISTULA IN ANO.

It is not easy to perceive how the disease named *fistula in ano* has become so well known to the public, and why the slight incision required for its remedy is performed in the theatre of the hospital with all the pomp and circumstance of a great operation. The

mere frequency of the complaint, and the unpleasant nature of its symptoms, are not sufficient to account for this; while its hidden seat, and the disagreeable feelings connected with it, so far from favouring exposure, must tend to conceal the knowledge of its existence, as well as the means employed for its treatment. In these circumstances, the interest taken in fistula, both by the profession and by the public, can be ascribed only to the well ascertained fact, that the disease does not admit of remedy except from an operation, which was formerly one of great severity, and even considerable danger.

Louis XIV. suffered from *fistula in ano*, and, being naturally unwilling to undergo the operation which his medical attendants assured him was necessary, listened to various proposals for curing the disease without having recourse to the knife. Instead of trying these methods on his own person, however, he collected a great number of his subjects who laboured under the same infirmity, and caused the proposed experiments to be tried on them. Some of them he despatched to the waters of Bareges, others to those of Bourbon, and many more he shut up in rooms, provided with every thing that could be suggested for the purpose in view. At the end of a year, finding that not a single patient had been cured, his majesty yielded to necessity, and permitted his surgeon, M. Felix, to perform all the incisions which he judged proper.

We have here a striking illustration of the necessity of the operation; and the importance attributed to its performance, as formerly practised, may be estimated from the number of medical men who were present on this occasion, together with the amount of their remuneration. Besides the surgeon and assistant-surgeon, there were two physicians, four apothecaries, and an apprentice, and the sum total of their fees was £14,700.[1]

The inefficacy of all remedial measures, except the knife, for curing fistula, still remains unquestioned, unless by inaccurate observers or unprincipled empirics; but the extent to which it must be employed, is now happily ascertained to be greatly less than was formerly supposed, and, through progressive improvement, it has been at length circumscribed within such narrow limits as hardly to deserve the serious title of an operation. In order to trace the steps which led to this important result, and to understand the true principles of treatment which have been finally established, we must consider the origin of fistula, the causes that give rise to it, the symptoms attending it, and the circumstances which impede its spontaneous cure.

In the first place, a collection of matter is formed under the integuments of the hip near the anus, and usually to one side of it. This deposition sometimes occurs quickly, with heat, redness, and

[1] M. Felix, 50,000 crowns = £6000; Dr. Daquin, 100,000 livres = £4000; Dr. Fagon, 24,000 do. = £1000; M. Bessiere, 40,000 do. = £1500; four apothecaries, (each 12,000 do. = £500) £2000; M. Raye, (apprentice to M. Felix,) 400 pistoles = £200.—*Dionis, Course of Surgical Operations*, p. 228.

pain of the part; at other times, slowly and insidiously, without any sign of inflammatory action, so that the first circumstance which attracts attention is a flat and ill-defined swelling that results from the presence of the fluid, together with thickening of the adjacent cellular substance. In which ever of these ways the abscess is formed—and every variety is met with, from the rapidity of a few hours to the slowness of as many months—the matter, if left to itself, sooner or later, by inducing absorption of the neighbouring textures, makes a way for itself to the surface. But as it is situated between the skin of the hip and the mucous coat of the rectum, it may effect evacuation through either the one or the other of these coverings. In conformity, however, with the general law as to progressive absorption, occasioned by the pressure of matters foreign to the healthy constitution of the body, it most frequently escapes by an aperture through the external integument. This opening is usually very small, often hardly perceptible, and if the cavity be examined after its contents have been discharged, the mucous membrane will be found almost completely denuded, to a small part of its extent, at the distance of an inch or a little more from the anus. As the matter to get into this situation would, if originally deposited externally to the sphincter, have to penetrate between the muscular fibres, its formation probably takes place in the vicinity of the inner coat of the bowel, whence it proceeds outwards, overcoming the obstacles opposed to its progress in this direction, instead of pursuing an inward course, in opposition to the general tendency, which leads to the external surface of the body.

If the patient has been previously in pain, he feels comparatively well after the matter is evacuated, and may suppose that he is to recover without any farther trouble. But the cavity of the abscess, though it contracts, does not become obliterated; the discharge continues of a thin and watery consistence; and the orifice acquires a still greater degree of straightness, at the same time generally projecting from the surface of the skin in the form of a small pimple-like protuberance, at the summit of which it is situated. This appearance is owing to an effusion of organisable matter round the opening, in consequence of the continued irritation which is caused by the discharge passing through it. From the same cause, the sides of the sinus acquire an increase of thickness and density so as to assume the condition which, in surgical language, is designated fistulous. If the disease be still permitted to pursue its course unchecked, a small aperture is sooner or later generally formed also through the thin denuded part of the mucous membrane of the rectum. It may seem surprising that this second opening should be formed after the matter has procured vent elsewhere; but there can be no doubt as to the fact, and it agrees completely with what is observed to happen in the case of abscesses situated in the neighbourhood of the urethra, which, after their evacuation, whether spontaneous or artificial, often discharge purulent matter alone for a time, and then urine also.

It happens sometimes, but very rarely, that an aperture is formed in the first instance through the mucous lining of the gut. This constitutes what has been called a Blind Internal Fistula. The other two conditions that have been mentioned, are named the Blind External, and the Complete Fistula. The history of the case, especially the existence of pain and tension in the vicinity of the anus subsiding after a discharge of matter from the bowel, the continuance of such a discharge, and the presence of a flat induration in the hip, with softness and depression in its centre, are the signs which lead to the detection of this form of the complaint. However long the fistula may be permitted to continue, no more than one internal opening is formed; but through the occurrence of successive abscesses, the external apertures are occasionally multiplied, and sinuses extend into the hip as well as the perinæum.

Causes of Fistula in Ano.—The process which has been described as leading to the formation of *fistula in ano*, occurs in both sexes, and at every time of life, but is out of all proportion more frequent in males than females, and is comparatively rare before twenty or after sixty years of age. I have operated repeatedly on children for this disease, and more than once on infants only a few months old; but, so far as I can recollect, in one instance only beyond the age of seventy.

The circumstances which occasion the disease, act either by exciting a predisposing liability to it, or by directly calling it into existence. Of the former, may be particularly mentioned chronic derangement of the lungs and digestive organs, especially the lower part of the intestinal canal. And of the latter, the most important are constipation of the bowels, sedentary occupations, and exposure to cold. It is difficult to trace the connection between pulmonary complaints and *fistula in ano;* but no point in pathology is better established than that there is such a connection; and attention is not unfrequently first drawn to the phthisical condition of a patient, by the disposition that he shows to suffer from the disease in question; whence it has sometimes been erroneously supposed that the discharge of the fistula brings on the disease of the lungs. As the great intestine is generally found ulcerated in the bodies of those who have died from consumption, it seems probable that the morbid state of this part, and not that of the lungs, is the exciting cause of fistula; but the disease certainly does occur in cases of pectoral affection which exhibit no symptom of intestinal disorder. Most frequently the cause of the disease cannot be precisely ascertained, and the patient is often not aware of its presence until he happens to notice the discharge of matter which proceeds from it. Among the causes of fistula, are sometimes reckoned disease of the bones of the neighbourhood, as caries of the sacrum, or exfoliation of the denser osseous texture, which composes the arch of the pubes. But the fistulous orifices in the vicinity of the anus, originating from this source, are not properly classed with a disease which exists independently of any other

local cause than its own peculiarity of position. They cannot be remedied by the same means as *fistula in ano*, and, if remediable at all, require different treatment.

Symptoms of Fistula in Ano.—Uneasiness about the anus, with a more or less copious discharge of thin purulent matter, staining the linen, and otherwise annoying the patient, are the most constant symptoms of the complaint. The occasional escape of flatus and mucous fluid from the rectum, are generally superadded in the case of a complete fistula. But the passage of feculent matters through the preternatural channel, though often mentioned as a part of the inconvenience experienced, does not usually take place; and, indeed, is never met with, except when the disposition to the disease is very strong, as in confirmed phthisis, in which case the aperture of the fistula, external as well as internal, instead of being small and circumscribed by effusion of organisable lymph, is large and flabby. Besides the exudation from the fistula, and more or less uneasiness about the part, especially in going to stool, people of much sensibility are farther distressed by a feeling of weakness and imperfection, which renders their existence almost intolerable. There are other persons of a less sensitive constitution, who, giving themselves no concern about the disease beyond its obvious effects, are able for a long while to endure the discomfort which it occasions. As an instance of this, I may mention the case of a gentleman, between fifty and sixty, on whom I operated for a complete fistula with two external openings, which had existed for thirty-five years. As has been already observed, the orifice of the sinus is usually very small, and, though generally rendered more manifest by being elevated above the surrounding surface, it still not unfrequently escapes the notice of the patient, who supposes that the discharge issues from the anus. Even the surgeon sometimes experiences difficulty in detecting the disease from this source of obscurity; and I once operated upon a gentleman for a complete fistula, after he had been assured by an eminent physician, who carefully examined him, that there was no morbid affection whatever in the neighbourhood of the rectum. The fluid which is discharged, varies both in quantity and quality, being at one time thin and watery, at another, thick and purulent. It is often so scanty and limpid, that obliteration of the cavity seems about to be accomplished. But sooner or later the flow is increased; perhaps a new abscess forms, leaving another orifice; at all events, the fistula remains as obstinate as ever, having no limit to its existence except an operation.

When the fistula opens into the gut, more or less flatus and mucus must pass through it, owing to the resistance which the sphincter muscle opposes to their exit by the anus, and thus adhesion or contraction in the surface of the sinus will be effectually prevented. But when the fistula is not complete, the reason why it should not heal like a sinus in any other part of the body is less apparent. The mere laxity of the texture, or any other peculiarity in the nature of the part concerned, is not sufficient to

account for this, since suppurating cavities in the neighbourhood of the rectum are known to heal very kindly and readily—as, for instance, that which results from the operation of lithotomy. When the sinus, as it almost always does, penetrates between the fibres of the sphincter, the obstinacy in question may be ascribed to the frequent motion and separation of the sides of the cavity, which must result from the action of the muscle. But even this obstacle to recovery is not always present, since the fistula sometimes lies quite superficially under the skin and mucous membrane, without passing through the muscular fibres at all. In such cases, it seems most probable that the detached and denuded state of the mucous coat of the gut impedes the healing action.

Treatment of Fistula in Ano.—It appears from the records of surgery, that the treatment of *fistula in ano*, until within the last hundred years, was extremely complicated and severe. The induration surrounding the walls of the sinus being attributed to a peculiar morbid action resident in the part, it seemed to admit of no remedy except by destruction or removal; and the cavity itself was thought to require complete division of the gut, throughout the whole of its extent affected, with subsequent dressings of the most careful kind. In conformity with these principles, we find that after the patient had been prepared by bleeding, purging, and regulated diet, corrosive sublimate, or other powerful escharotics, were introduced into the fistula, so as to bring away a slough in the form of a cylinder; that pieces of gentian root, or sponge tent, were next inserted to dilate the cavity, and, by thinning the partition between it and the gut, facilitate the third step of the operation, which consisted in dividing the septum to its farthest extent; and that, until the cure was completed, various carefully medicated dressings were daily introduced. Such being the established principles of practice, different practitioners followed out the objects which they kept in view by a variety of methods. Some, instead of the slow and uncertain action of caustic, employed a knife for removing the callosities, either scooping them out at once, or cutting freely through them in several directions, so as to inflict what was deemed sufficient injury to insure their destruction by sloughing or suppuration. Some divided the septum between the gut and sinus by means of knives, or scissors, or apparatus contrived for the purpose, such as what was called the probe-razor; and others thought it better to transfix the gut with a needle, so as to include the partition in a ligature of thread, or lead wire.

The treatment thus conducted was not only tedious and painful, but often attended with alarming consequences. Inflammation and constitutional disturbance were apt to follow, and the extensive incisions practised for the removal of callosities, or dividing the septum of a deeply penetrating sinus, frequently occasioned very formidable hemorrhage, as well from its amount as the difficulty of arresting it. The cure, moreover, was not always complete, a discharge of matter occasionally still continuing, in consequence of the deep wound not healing at the bottom; and we have

the testimony of many authors who wrote at the period referred to, that the effect of freely cutting out the diseased parts was frequently so injurious, or rather destructive to the sphincter, as to occasion constipation, and what was equally distressing, though at first sight hardly compatible with it, incontinence of the bowels, their solid contents being retained, and the fluid involuntarily expelled. It is no wonder, then, that *fistula in ano* came to be regarded as a complaint meriting the most serious apprehension of the patient.

In 1765, Mr. Pott published an excellent treatise on the disease, in which he reprobated the practice of destroying the callosities by caustic, and cutting them out with the knife, which proceedings he considered equally unnecessary and hurtful. He pointed out that the cavity of the abscess, and consequently that of the fistula, resulted not from a loss of substance in the part, but merely from distension of the texture, in which suppuration took place; and that the callosities or surrounding induration proceeded not from any new formation, but from induration of the cellular and adipose textures bounding the cavity. On these grounds, he maintained that, in order to effect a cure, it was not necessary either to take any thing away, or to use means for promoting the growth of new substance; that all really required was to relieve the parts concerned from the continued irritation, which caused and kept up the callous thickening; and that this object could be attained most certainly by simply dividing the septum, "so as to lay the cavities of the gut and abscess into one," abstaining from all escharotic or irritating applications, and using the mildest dressings. For performing the operation, he recommended a blunt-pointed curved bistoury, as the easiest and most manageable instrument.

The soundness of Mr. Pott's principles, the forcible language in which they were expressed, and the authority derived from the public field where he exhibited their practical application, produced a strong impression on his professional brethren, and the treatment of fistula has ever since been in a great measure free from the objectionable practices formerly in use. As was to be expected, however, many practitioners clung to the methods in which they had been educated; and even in the present day there are some who, whether from imbibing the bad example thus transmitted to them, or from an unhappy peculiarity of judgment, still prefer the old and unjustifiable process of excision. Fifteen years ago, I saw an eminent professor of surgery in Paris cut out the fistula; and I understand that he continues to pursue this practice. About eight years ago, a middle-aged woman came under my care in the Surgical Hospital, on account of a recto-vaginal fistula, and stated that her complaint commenced with a *fistula in ano*, for which she had had an operation performed by the surgeon of a provincial hospital, who cut something out, and laid it on the table, since which there had been a communication between the rectum and vagina. Last year, a gentleman from the north of England applied to me on account of some unpleasant consequences result-

ing from an operation, or rather series of operations, to which he had been subjected, on account of *fistula in ano*. His principal complaint was inability to retain the contents of his rectum, which, notwithstanding the resistance of a carefully constructed bandage, were wont to be suddenly and involuntarily discharged, so as to cause great discomfort, and constant apprehension. Though prepared to find something far wrong, I was not less surprised than shocked, upon inspecting the seat of the disease, to see no appearance of the anus, but instead of it a deep excavation, at the bottom of which the mucous coat of the bowel presented itself to view, completely divested of the sphincter. From these and other facts of the same kind that might be mentioned, I fear it must be concluded, that the plan of excision is still not entirely abandoned; but, feeling assured that those who persist in adhering to it, notwithstanding all that has been said and written on the subject, would not have their views altered by any argument in my power to use, I shall leave them to follow the progress of improvement at their own leisure, and shall proceed to explain some important steps that have been established in advance of Mr. Pott's practice.

It had been noticed by Sabatier, and other good surgeons, that the internal opening of a complete fistula was generally seated near the orifice of the anus. But in 1820, M. Ribes had the merit of showing[1] that it was always so situated, never exceeding the distance of an inch and a quarter, and often lying considerably nearer the skin. The importance of this observation will appear, when it is recollected that the operation requires division of the parts intervening between the two openings of the fistula; since, unless the internal one be sought for in the proper place, it may escape detection, and thus not only occasion an unnecessarily high section of the septum, but, from not being included in the incision, lead to a continuance of the disease. When the internal opening is sought for at the summit of the sinus, it cannot be found, so that the fistula is apt to be supposed incomplete or blind external; and M. Ribes, avoiding this error, ascertained that an internal aperture existed much more frequently than had formerly been supposed. He went, indeed, into the opposite extreme, contending that it was present in every case requiring the operation, and accounting for its constancy by attributing the origin of the disease to ulceration of the mucous coat of the gut. But I have already stated that the abscess which gives rise to fistula is very generally discharged outwards in the first instance; and every attentive practitioner must have remarked that an internal orifice is very seldom met with in recently formed fistulas; which facts are quite inconsistent with this theory of M. Ribes.

I have ascertained farther, that, in those cases where an internal aperture does not exist, the mucous membrane at the part in which it would be situated if present, is not only denuded, but rendered so thin that the perception of a probe through it is hardly less distinct

[1] Quarterly Journal of Foreign Medicine and Surgery. 1820.

than if it had entered the rectum; and that, if the incision extends to this point, the cure will be no less certain than if an opening into the gut had existed.

In regard to the importance of the principles thus established, I may, in the first place, remark, that limiting the incision within the narrow bounds that have now been mentioned, lessens not only the difficulty of its performance, and the suffering of the patient, but also the risk of hemorrhage, and the trouble of after treatment; since, instead of having to keep separate the edges of a deep and not easily accessible wound, the surgeon has merely to prevent adhesion between the lips of a superficial cut. But the operation, while thus simplified in its performance, is also rendered more certain in its effect, since in cases of complete fistula the most extensive incisions will fail to afford permanent relief, unless they include the internal opening. I have very frequently operated on complete fistulas that had been looked upon as blind external, from the internal orifice having escaped detection through unacquaintance with its position; and the repetition of operations for the disease, which are so frequently heard of in practice, are no doubt referable to this mistake.

In the reports of surgical cases which I have published from time to time since the year 1829, and also in the systematic work on surgery, of which the first edition appeared in 1831, I have endeavoured to explain and impress these principles, which have been uniformly acted upon in my own practice. They are still, however, far from being generally adopted, and many writers of the highest authority continue to inculcate the practice of Mr. Pott. Sir A. Cooper says,[1] "if the fistula does not open into the intestine, you must pass the instrument (a bistoury) up the sinus till it reaches the extremity."—"A very copious hemorrhage generally follows the division of the septum," &c. Mr. Copeland says, "In this operation, though there are no vessels of very considerable size in danger of being wounded, yet, when the sinus extends far up the side of the gut, a hemorrhage now and then takes place, either at the time of the operation, but more usually a few hours after it, which, if it be not important from the magnitude of the divided artery, becomes often so from the difficulty, perhaps impossibility, of securing it by a needle and ligature."—"I will venture to say, that it (the hemorrhage) has occurred to almost every surgeon who is in the habit of performing the operation."—"After many unsuccessful attempts to secure a bleeding vessel under such circumstances, I once accomplished it by introducing a blunt gorget into the rectum; and, by keeping the gut thus dilated, I was enabled to see the orifice of the bleeding artery, and to secure it."[2] Mr. Liston says, "Some con-

[1] Surgical Lectures, p. 425. 1837.

[2] The bad effects of dividing the septum to its farthest extent are well illustrated by the following case which Mr. Copeland has given:—

"A carpenter, about thirty years of age, had the operation for *fistula in ano* performed on him in the year 1803. There were two extensive sinuses in the nates divided; but the principal one extended above three inches up

tend that fistulæ are always complete, that they commence from within, and that the internal opening is always at one particular point; but such, according to my experience, is very far from being the case."—"Having reached the extreme depth of the canal, the direction of the instrument's point is changed, so as to apply its cutting surface to the coats of the bowel at that part."[1]

If the case be as I have stated it, the opinions and practice of which these quotations afford a specimen must tend to occasion great unnecessary suffering; and, therefore, believing that I have not in any respect exaggerated the benefits which are derived from the principles at present advocated, I think it right once more to state them.

1. In complete fistula, the internal opening does not lie farther from the anus than an inch and a quarter, and is frequently much nearer to it.

2. In external fistula not communicating with the gut, the mucous membrane is denuded and attenuated at the part where the opening would be if there were one.

3. In performing the operation, it is merely necessary to divide the parts lying between the external and internal apertures, or denuded part of the mucous coat corresponding to the latter.

4. In the after-treatment, it is not necessary to interpose any dressing between the edges of the wound beyond the first forty-eight hours.

Having thus endeavoured to explain the pathology and treatment of fistula in general, I may now consider more particularly the different stages of the complaint.

When the formation of matter in the vicinity of the anus is threatened by the occurrence of pain, hardness, or swelling of the part, it is usual to abstract blood locally by leeches or cupping. Some relief may thus be generally obtained,—but the improvement

the side of the gut, and then perforated it; this also was laid open. There was considerable hemorrhage at the time of the operation; but the patient fainted, and the bleeding stopped; and, when the wound was dressed, he went to bed. After he had been in bed about an hour, the hemorrhage returned, and the bleeding artery was so high up the sinus, as to be entirely out of the reach of the needle and ligature; the gut, therefore, and the wound, were filled up with compresses of lint, wet with spirit of turpentine; and, for some time, it was thought that this mode of compression had succeeded in stopping the hemorrhage; but, during our fancied security, his pulse became hardly perceptible, his lips pale, and the whole of the body was in a cold sweat. He was now supported by wine and other cordials; and, in a short time, the hemorrhage burst out again, with as much violence as ever, and continued for more than an hour. All the compresses were now removed, the rectum cleared as much as possible of coagulated blood, and the wound left without any dressings. The hemorrhage stopped, and did not return again; but very large quantities of coagulated blood were evacuated with the fæces for three days afterwards. He was, as may be supposed, extremely debilitated by this loss of blood, but finally recovered his strength, and his fistula was dressed, and cured in the usual way."—*On Diseases of the Rectum and Anus*, pp. 159—161. 3d edition.

[1] Elements of Surgery, vol. iii. pp. 70—82.

is neither complete nor permanent, and the progress of the complaint, though it perhaps becomes more slow, is not less troublesome,—being rendered sluggish and unmanageable. The application of heat and moisture, by means of the hip-bath or fomentations, has a very soothing effect on the patient's uneasy feelings, and accelerates the termination of his complaint, either by inducing resolution of the inflammatory action, or promoting suppuration. Evacuation of the bowels should be facilitated by the administration of gentle laxatives, such as castor oil, and injections of warm water into the rectum; and the patient must confine himself to the horizontal posture, as well as the antiphlogistic diet, with strictness in proportion to the acuteness of his symptoms.

So soon as fluctuation can be perceived, it is considered right to evacuate the matter, which otherwise might diffuse itself into the neighbouring loose cellular texture, and lay the foundation of troublesome sinuses. The knife is now almost exclusively employed for this purpose, and a free incision is made by it from the hip towards the anus, through the centre of the undermined integuments. Poultices are then applied for a few days until the inflammatory engorgement subsides, after which the cavity gradually contracts, and the case passes into the condition of a sinus or fistula. It might be thought better to divide the septum between the abscess and gut in the first instance, and some practitioners have advised this to be done. But it appears that recovery after the operation is not so speedy or so certain, when it is performed thus early, as when it is delayed until the textures affected are allowed to subside into their natural state.

In examining a case of fistula with the view of operating, the fore-finger of the left hand should always be introduced into the rectum, while the probe is guided with the other, since it is otherwise almost impossible to discover either the existence or the position of the internal opening. The probe should be slightly curved, and have its concavity turned towards the opposing finger, which is often able to detect the orifice, or rather the irregular induration surrounding it, and thus assist in directing the instrument. If there is no internal opening, the same exploration will discover the denuded part of the mucous membrane which occupies its place, and equally with it determines the limit of the incision. As the fistula is situated most frequently on the right side of the anus, and very rarely either behind or before it, the most convenient position in general is stooping forward, with the arms resting on a table or chair. But when the orifice happens to be on the left side, unless the surgeon is ambidexter, the patient should be placed on his back, with the limbs elevated.

In performing the operation, a knife will be found the most easily managed, which is narrower in the blade, particularly at the point, and less curved than the bistouries in common use. It should be gently insinuated up along the fistulous canal, while the operator's finger in the rectum assists in guiding its direction, and passed through the internal aperture, if there is one, or pushed

through the mucous membrane, if it still remains entire; the point, resting on the finger, is then brought out of the gut; after which, by a sawing motion of the blade, or a steady movement of it forwards, the septum is divided almost instantaneously with little pain, and hardly any bleeding. When much difficulty has been experienced in finding the internal opening, it is a prudent precaution, especially for a surgeon not much practised in the operation, to push the probe through the sinus, and bring its point out at the anus, before using the knife, since it is thus impossible to miss the orifice by transfixing the thin membrane which surrounds it. If any sinuses extend under the integuments of the hip or perinæum, they should now be laid open with the knife, and then small pieces of dry lint are placed between all the cut edges. This dressing will require to be renewed on the following day, when the patient's bowels have been moved, and after this a pledget of lint, moistened with a weak solution of sulphate of zinc, or water alone, and covered with a piece of oiled silk, to prevent it from drying, may be placed over the wound until the cure is completed. A T bandage, or couple of handkerchiefs put on in this form, will enable the patient to keep the dressing applied without confining himself to the horizontal posture, which, beyond the first day or two, is quite unnecessary. Great attention to cleanliness will be required, and frequent ablution with soap and water contributes not only to comfort but also to a speedy recovery.

What has now been said relative to the treatment of *fistula in ano*, applies to those cases of the disease that admit of remedy, which fortunately constitute a large proportion of the whole But before determining to operate, or holding out the probability of relief from doing so, it is necessary to ascertain that no obstacles exist likely to frustrate the surgeon's efforts, and defeat the patient's hopes. The most common of these opposing circumstances is a phthisical condition of the patient, which, as has been already observed, powerfully predisposes to the disease, and in the event of an operation being performed, is apt either to impede the healing of the wound, or lead to relapse through the formation of new abscesses. Any tendency to this condition, therefore, should render the prognosis in respect to an operation more or less unfavourable, though its performance cannot always with propriety be declined. Patients, after exhibiting symptoms of pulmonary disease, frequently recover so as to live for many years nearly or altogether free from complaint; and while the issue of their principal disorder is thus uncertain, it would be wrong to withhold the chance of recovery from the minor one, which often occasions more anxiety than the other. The refusal to operate also requires a very painful explanation; and the slight incision which has been shown to be all that is necessary for curing the disease, if it has not this effect, at least makes the patient more comfortable, by lessening the irritation of the parts concerned, and moderating the discharge. In these circumstances, unless the fatal disease is so far advanced as to render surgical interference improper, though the operation for

fistula may not with prudence be proposed or urged in consumptive cases, it may be performed if requested by the patient.

Fistulous openings near the anus, and leading into the rectum, sometimes communicate also with the urethra. The origin of this complicated form of the disease is an abscess, situated between the prostate gland and perinæum, which, from not being evacuated early by incision, discharges its contents into the urethra and rectum, before overcoming the resistance to an outward course, which is opposed by the fascia of the perinæum; and when at length openings do take place in the skin, they are usually situated at the verge of the anus and root of the scrotum. Flatus and thin feculent matter escape by the urethra, urine issues from the rectum, and a copious fetid discharge proceeds from the external orifices. The patient suffers great and unceasing distress, and, unless relieved by efficient treatment, ultimately sinks under the continued irritation and exhaustion.

These formidable consequences of allowing the abscess to open spontaneously, render it incumbent on the surgeon to be careful in recognising the disease at an early period, and giving free vent to the matter, by an ample incision through the integuments and fascia of the perinæum. The disease is generally induced by exposure to cold. It commences with pain in the region of the prostate gland, aggravated by micturition and going to stool, and is attended with more or less fever. When the matter begins to accumulate, difficulty is experienced in voiding the urine, sometimes to the extent of complete retention, and requiring the catheter to be introduced. The patient may continue in this state without any alteration, except the occasional occurrence of rigors, for eight or ten days, or even longer, until the fluid makes a way for its escape. The perinæum, when examined, is found to be fuller than natural. But, as the integuments retain their ordinary colour and consistence, this change may readily escape observation; and fluctuation, owing to the depth of the abscess, can hardly be perceived, unless the finger is introduced into the rectum, through the coats of which the fluid is easily felt. I have frequently been asked to draw off the water when obstructed in this way, without any suspicion having been excited as to the cause of difficulty, and have known the practitioner first take alarm from observing that the catheter contained pus. Examination by the rectum, together with the history of the case, will leave little room for doubt as to the existence of matter. But if there should still be any uncertainty, it will always be right to make an incision in the perinæum, since this can do no harm, and the withholding of it exposes the patient to the danger of all the distressing consequences that have been mentioned, as resulting from spontaneous evacuation of the abscess.

When the disease has advanced to its fistulous state, it is necessary to lay open all the sinuses; and even then the recovery is not always speedy or complete. The operation should be commenced by dividing the septum between the gut and the cavity left by the

abscess. For this purpose, the knife is introduced into the orifice which lies nearest the verge of the anus, guided upwards until it enters the gut, and then carried outwards through the septum, which in this case is generally more extensive than in an ordinary fistula, from the internal orifice being seated higher, even above the inner sphincter. The sinuses which extend between the anus and scrotum are next to be laid open, and then pieces of dry lint are inserted between the cut edges. The deep incisions which are sometimes required, expose the patient to the danger of hemorrhage; and if there should be any appearance of this, the bleeding vessels are, if possible, to be tied, or cold applied to the wound while the hips are elevated, which means seem far more effectual than pressure, owing to the looseness of the textures concerned. After the cure appears to be complete, a very small fistulous communication is apt to remain between the urethra and rectum, allowing a few drops of urine to pass occasionally. If this does not close within a moderate time, or proves annoying to the patient by exciting his alarm, a red-hot iron wire should be introduced into the orifice, exposed by a speculum, as often as may be necessary for inducing contraction and obliteration of the slender canal. In all cases of this kind, especially those which have been long established, it is proper to search the urethra and rectum for stricture; since this additional complication is not unfrequently met with, whether as a cause or consequence of the fistula it is not always easy to determine.

Fish bones, and other bodies of a similar form, are occasionally arrested in their passage through the alimentary canal by the *sphincter ani*—and may then penetrate the coats of the gut, so as to cause the formation of an abscess, which of course will not admit of being healed so long as the irritating substance remains. It is only by examination with the probe or finger that this complication can be discovered, the patient seldom being aware of having swallowed any thing improper, or at all suspecting the cause of his complaint. When the nature of the case has been ascertained, the fistula should be laid open in the ordinary way, and then, if necessary, more extensive incisions may be made to permit extraction of the foreign body without violence, or tearing of the surrounding parts.

Fistula in ano is sometimes found associated with stricture of the rectum, and in this case has been attributed to the resistance which is opposed to the passage of the contents of the rectum by the preternatural contraction of the gut. If so, the orifice ought to be situated higher up than the stricture, instead of which, it occupies the usual position, about an inch from the anus. The explanation thus afforded, therefore, cannot be received; and we must suppose that, if the stricture has any share in causing the fistula, it must act merely by exciting irritation in the neighbourhood. In regard to the performance of the operation, the presence of a stricture does not require any deviation from the usual course of proceeding; but the recovery of the patient will of course depend

upon the practicability of restoring the rectum to its natural capacity and texture.

The abscesses which result from the *morbus coxarius*, or hip disease, in its advanced stage, frequently open in the hip in its lower and back part; but those which proceed from caries of the sacrum, and those connected with exfoliations from the ischium or pubis, discharge their contents near the anus, so as to present the appearance of ordinary fistula at this part. It is obvious that, if the sinus depends upon caries, it will not be benefited by any extent or number of incisions; and that if it leads to an exfoliation, the detached portion of bone must be extracted, as an essential step to recovery. About ten years ago, I was asked to see a young man who had suffered several operations for what was supposed to be fistula, without obtaining relief, and had at length become exhausted beyond the hope of recovery. A careful examination led to the discovery of an exfoliation, lying inclosed in a capsule of cartilaginous firmness, formed by the origins of the flexor muscles of the knee, from the tuberosity of the ischium. After its extraction, the patient quickly recovered, so as to marry and have a family. I lately saw a young woman who had suffered from *fistula in ano* for five years, and wished to have the operation performed. On introducing the probe, I felt it grate past a hard surface, and extracted a thin scale of bone, which had probably been detached from the arch of the pubis, as she attributed her complaint to a strain sustained in hastily descending from the top of a coach.

CHAPTER II.

HEMORRHOIDS.

The expression Hemorrhoids, in the meaning usually applied to it, comprehends various tumours which grow at the verge of the anus. It thus denotes a disease of more frequent occurrence than perhaps any other to which the human body is subject, very few people, especially in the higher ranks of life, being entirely free from it in one form or another. The morbid swellings do not all possess the same constitution and characters, but differ in both respects so widely, as to require being divided into three distinct sorts. In the *first* place may be mentioned those which depend on enlargement of the veins at the extremity of the rectum. *Secondly*, those termed External Hemorrhoids, formed by enlargement of the thin skin and subjacent cellular texture, which, lining the orifice of the gut, and connecting the mucous membrane of the bowel with the external integument of the body, though naturally seated neither within nor without the sphincter, projects beyond it

when distended by inflammatory engorgement. *Thirdly*, those which consist of a vascular development of the mucous membrane, constituting tumours that possess a great tendency to bleed when protruded without the anus. They do not occupy this position except in consequence of the expulsive efforts employed in evacuating the bowels, and so soon as these cease to operate, or pressure is applied externally, return into their proper place within the sphincter, whence they are named Internal Hemorrhoids. Before particularly considering the structure, symptoms, and treatment of these tumours, it will be proper to enquire generally into the circumstances which determine their formation.

Causes of Hemorrhoids.—When the bowels are evacuated, more or less of the lining membrane of the anus is everted, and distended by the resistance which is then opposed to its venous circulation. Constipation, by rendering the expulsive efforts more continued and laborious, must increase this effect, and tend to produce permanent enlargement of the protruded part. But constipation usually depends on errors of diet or regimen, particularly redundant nourishment, and deficient exercise, causing derangement in the healthy action of the digestive organs, that not only leads to irregularity in the evacuations, but likewise, through the medium of constitutional disturbance, proves a fruitful source of local disease; and as the parts about the extremity of the rectum are in such circumstances, as has just been explained, exposed to more than usual irritation, it is not surprising that they should frequently become the seat of morbid action. The disease being once established, will promote its own increase by impeding evacuation of the bowels, and from the pain as well as hemorrhage attending it, deranging the healthy action not only of the digestive organs, but likewise of the whole system. Pregnancy, enlargement of the liver, and other abdominal tumours, will, by opposing a free return of blood from the pelvis, favour the production of hemorrhoids, especially those which depend upon a varicose state of the veins. In addition to the exciting causes which have been mentioned, it would appear that a predisposition to the disease frequently exists, since in some people it is induced much more readily than in others. Persons thus prone to the complaint occasionally suffer from it at the age of puberty; but it seldom proves troublesome until the frame is fully developed, and is generally most distressing from the age of 20 to 50.

Venous Hemorrhoids.—The lower part of the rectum is supplied with numerous veins lying under the mucous membrane, through which they may be readily distinguished. These vessels in the neighbourhood of the anus are liable to varicose enlargement, and then present the appearance of irregular tumours encroaching on the cavity of the gut. They extend for an inch or two above the anus, but hardly show themselves beyond it, unless the nates are held aside, when they may be seen projecting from the sides of the orifice. They possess a dark colour, smooth surface, circumscribed form, and tense consistence. The veins thus altered are liable to inflammation of the same sub-acute kind to which the varicose

vena saphena is subject. In this state they become larger, harder, and excessively painful, especially when in the slightest degree compressed, so that sitting and evacuating the bowels occasion great distress. The blood circulating through them frequently coagulates during such attacks; and if it subsequently undergoes absorption, a spontaneous cure may be accomplished. At other times suppuration ensues in the surrounding cellular substance, and may thus lay the foundation of *fistula in ano*. A discharge of blood also occasionally proceeds from ulceration of the enlarged veins, just as happens in the leg.

This form of the disease has attracted more attention than either of the others, and has even been supposed to be the sole cause of hemorrhoidal swellings. In a slight degree it is certainly very common, and to this extent frequently exists, along with enlargement of the neighbouring textures; but without such combination it rarely attains sufficient size to produce much inconvenience, or attract the patient's notice. The situation of the visible part of the tumours, neither within nor altogether without the sphincter, together with their form, consistence, and colour, render their recognition very easy. In regard to the treatment, the tendency of the venous tissue to resent irritation forbids any operation; and excision as well as puncture, which have been recommended, should both be carefully avoided, lest they excite inflammation of the enlarged vessels, and give it the unmanageable character which distinguishes it when of traumatic origin. Soothing measures are the most useful, such as rest in the horizontal posture, gentle laxatives, as castor oil, injections of tepid water into the rectum, and the hip-bath. When the symptoms are severe, leeches may be placed round the anus, opiate injections should be employed, and lotions, containing acetate of lead with opium, applied to the inflamed parts. By these means the paroxysm is subdued in the course of a few hours, or days at the farthest; and by care afterwards in guarding against the causes of excitement, future attacks may either be prevented or rendered less distressing.

External Hemorrhoids.—The thin skin which connects the internal mucous and external cutaneous covering at the anus, like the same texture in other situations as the lip and prepuce, is liable to swelling, from distension of the loose cellular substance which lies under it. Any irritation in the vicinity may occasion this; and the derangement once induced contributes to its own increase, by causing protrusion of the affected part beyond the sphincter, when, the circulation being impeded, the tendency to inflammatory engorgement is promoted. A tense red tumour, or series of tumours, may now be seen at the margin of the anus, easily distinguishable from varicose veins in the same situation, by their florid colour, pyriform shape, and more yielding consistence. In other respects the symptoms are nearly the same. The inflammation usually terminates in resolution, but sometimes leads to suppuration, and also, though very rarely, proceeds to mortification. When the engorgement attending the excited action subsides, the

distended skin may resume its natural condition completely, but, in general, does so only partially, and remaining relaxed, constitutes a permanent pendulous fold at the orifice of the gut, always ready to resent any irritation, and swell to its former or even a still larger size.

The artificial mode of life which results from the usages of civilised society tends so strongly to the production of hemorrhoidal disease, that few people remain altogether free from it; and this form is the one which it most frequently assumes, often existing independently of any other morbid affection, and very generally accompanying other diseases of the rectum. Various methods have been pursued in the treatment of external hemorrhoids; but it is needless to mention any other than excision, since this is undoubtedly the best mode of removing them. Scissors curved to one side will be found the most convenient instrument for the purpose, and may be employed either alone, or with the assistance of a hook to steady the tumours during their separation. The operation is very easy, and attended with little pain or bleeding. It is also quite effectual. The best time for its performance is when the hemorrhoids are in a quiescent state; and it should always be insisted upon when they are present in a case requiring any other operation, since, unless removed previously, or at the same time, they would be apt to suffer from the irritation, and, by adding the complication of inflamed piles, greatly increase or prolong the patient's sufferings. The blades of the scissors should be directed from the circumference towards the centre of the anus, in order to get at the root of the tumours without taking away any sound skin. A piece of dry lint is the only dressing required in the first instance, and often proves sufficient, as the raw surface readily contracts and heals. If necessary, a sulphate of zinc lotion may be applied.

While the hemorrhoids are suffering from inflammation, excision may still be practised, and it should be resorted to if the patient is willing to endure the pain that attends cutting in this state, in order to get speedily relieved from the complaint. If it be thought better to delay the radical cure until the parts get into a condition more favourable for its easy performance, the same soothing means that have been already mentioned as proper in the cure of inflamed venous hemorrhoids should be employed. Unless the tumours are very tense, it is also useful to make gentle pressure on them, to unload their vessels, and promote their return within the sphincter.

As excision always affords an easy, safe, and effectual remedy for external hemorrhoids, it seems unnecessary to say much of the other means which have been proposed, and more or less extensively adopted. The ligature is decidedly objectionable, as being infinitely more tedious, and also more painful than the knife or scissors, without any compensating advantage. The application of astringent ointments, such as the *Unguentum Gallorum*, is very inefficient, and calculated rather to amuse the patient than to afford him any real benefit; and the introduction of bougies can hardly produce more than a little temporary relief. The best palliatives

are attention to regimen, the use of gentle laxatives, such as sulphur with cream of tartar, and Ward's paste, which in all diseases of the rectum attended with relaxation has often a remarkably good effect. A portion of it, about the size of a nutmeg, may be taken twice or thrice a-day. Of local applications the ointment just mentioned, together with an admixture of opium, or subnitrate of bismuth, may be regarded as the best.

Internal Hemorrhoids.—The mucous membrane at the extremity of the rectum, immediately above the thin skin, which is the subject of the last mentioned swelling, is liable to a morbid development of its texture that gives rise to very serious symptoms. There are thus formed tumours seated altogether within the sphincter, unless when forced into view by sufficiently powerful expulsive efforts, and hence named Internal Hemorrhoids. They possess an irregularly round form, a florid colour, a granular uneven surface, and very vascular structure, so as to bleed freely from the slightest injury. They resemble a strawberry very much in appearance, and, seldom existing singly, in general constitute a more or less complete annular swelling, which, when protruded beyond the anus, seems to close the aperture of the gut completely, and is surrounded by an external ring proceeding from distension of the neighbouring loose texture, which is the seat of external hemorrhoids. The two kinds of growth are easily distinguished, not only from their difference of position, the one being seated within the other, but also by their difference of surface, the one being smooth and the other granular.

The substance of the internal hemorrhoidal tumour is so vascular and disposed to bleed, especially when forced beyond the sphincter, that it has been considered similar to the erectile tissue which composes aneurism by anastomosis and nævus. But these diseases are, with few if any exceptions, of congenital origin; while internal hemorrhoids rarely make their appearance before the age of maturity; and the vessels of the latter growth, instead of being dilated into the cellular-looking structure which composes the former, are small and arborescent. There hence does not appear to be any analogy between the two morbid structures farther than their disposition to bleed.

How this growth of the mucous membrane originates it is not very easy to explain. The circumstances which have been mentioned as accounting mechanically for distension of the veins and swelling of the lax textures at the verge of the anus, cannot operate here; and we must be satisfied with enquiring into the causes which operate less directly in producing the disease. Like other hemorrhoidal affections it occurs chiefly in the vigour of life. It is much more common in males than females, and in both sexes greatly more frequent in the higher than the lower ranks of society. Residence in warm climates, a luxurious diet, deficient exercise, and excitement of the generative organs, are the circumstances which seem to have the most powerful influence in determining its commencement, and encouraging its progress, especially when several

of them operate together. Literary pursuits and a professional life, which admits or requires sedentary habits, are observed to favour the production of this morbid excrescence. It would seem, in short, that the superfluous nourishment usually acquired by persons in easy circumstances, when not expended in bodily exertion, is apt to find vent through the channel of internal hemorrhoids, into which it may be directed by the opposition afforded by a sitting posture to the free return of the blood circulating in the pelvic viscera.

The symptoms which attend this kind of hemorrhoid may be divided into three sorts, namely, painful sensations, protrusion of the tumour, and hemorrhage. Some patients complain of these inconveniences equally; others complain of them singly. But in general they are all present together, while one of them predominates by its severity, and the attention which is consequently bestowed upon it. The painful sensations are referred either to the seat of the disease itself, or to the urinary organs, with which the rectum is intimately united in sympathy. The pain of the swellings is sometimes described as dull and oppressive, at others sharp and lancinating. The irritation of the urinary organs occasions uneasy feelings in the course of the urethra, frequent desire to make water, and difficulty in doing so. There is no regular proportion between the extent of the disease and the severity of its symptoms, nor is there any difference observable in the appearance of the tumours adequate to account for the variety that occurs in the nature as well as the degree of the annoyance which they occasion, and which no doubt must depend upon individual peculiarities of local or constitutional irritability. A gentleman, about 35 years of age, complained of pain at the extremity of the rectum, which was seldom entirely absent, and from which he occasionally suffered so much as to feel quite unhinged and incapacitated for any exertion either of body or mind. On examination I could find no morbid appearance except a very small internal hemorrhoid, not larger than the point of the little finger, the removal of which completely relieved him. The urinary symptoms are sometimes so prominent as to call attention from the true seat of the disease. A gentleman, about fifty, suffered for years from excessive pain in the region of the bladder, with frequent desire to make water. He consulted a great many physicians and surgeons of eminence, and had at length made up his mind that the disease, in accordance with the opinion of a distinguished pathologist, was tic-douloureux of the bladder, when a medical friend thought of examining his rectum, and discovered several large internal hemorrhoids, which I removed to the patient's great comfort.

The protrusion of the swellings is a nearly constant symptom of the disease, and is troublesome merely in proportion to their size. At first the tumours pass beyond the sphincter only during the forcible and continued efforts to evacuate the bowels which attend constipation; but by and by they descend more readily, and return with more difficulty, requiring to be pushed up by external pressure; and in cases of old standing, where the skin lining the anus,

from being frequently put upon the stretch, remains permanently relaxed, hanging in folds round the orifice, the tendency to protrusion is so great, that the hemorrhoids descend not only on all occasions of going to stool, but also whenever the patient makes the slightest exertion, or even when he simply assumes the erect posture. The protruded part is of course painful, especially when subjected to pressure, and, by soiling the patient's clothes with the mucous and bloody discharge that issues from its surface, is a constant source of vexation. A middle aged lady, whom I saw with Dr. Begbie, had been confined for two years to the horizontal posture by hemorrhoidal swellings, which descended from the gut whenever she attempted to walk or stand. After the disease was removed she could walk for miles without any inconvenience.—A gentleman, about 50, whom I saw with Dr. Davidson, had suffered for upwards of eighteen years from a protrusion of this kind, and, holding an office in the courts of law, which frequently required him to sit for many hours in public, endured more distress than it is easy to describe or imagine. He was completely relieved by removal of the enlargement.—A man, about forty, from Dundee, was lately in the hospital here under my care on account of a hemorrhoidal protrusion, which had troubled him for more than twenty years, and latterly disabled him entirely for his occupation, which was that of a weaver. He returned home quite well.—Many other cases could be mentioned in illustration of the protrusion of the tumours constituting the prominent feature of the disease. It is such cases, which generally go under the title of *prolapsus ani*, and, being supposed to depend upon weakness of the sphincter, are palliated very imperfectly by the application of bandages to support the gut. Such means of palliation are no less unpleasant than inefficient, and in some respects, indeed, may be considered as even more irksome than the disease itself. It is therefore of the utmost importance to take a correct view of the derangement, which leads to an easy, safe, and effectual remedy.

The bleeding which proceeds from internal hemorrhoids is the most alarming symptom attending the disease, and the one which occasions the most serious effects. It takes place when the tumours are protruded beyond the sphincter, and varies in amount from a few drops to several ounces. The blood sometimes seems to ooze from the surface, and at other times springs out in a jet, extending, if permitted, to the distance of several feet; whence it is often supposed that the patient has ruptured a blood-vessel. The quantity lost at each time of going to stool is very unequal, and varies with the condition of the patient, increasing when there is general irritation of the system or excitement of the pelvic viscera, and diminishing in circumstances of an opposite kind. For weeks or months the hemorrhage may cease altogether, and then return more vigorous than ever; but its general tendency is to increase with the duration of the complaint. At its commencement the discharge of blood may in some instances be regarded as salutary, as it occasionally seems useful in relieving other parts of the system

from oppression. But when it becomes habitual and copious, besides the unpleasant feelings connected with it, very serious derangements of the system are apt to be produced. The patient loses flesh, and acquires a remarkable paleness of complexion, which is afterwards exchanged for a peculiar dingy yellow hue, like that of imperfectly bleached wax. The lips no longer possess their vermilion colour, and resemble those of a dead body; the tongue too has a blanched appearance very characteristic of the state induced by excessive or continued depletion. These symptoms are attended with great listlessness, or want of energy both of body and mind, disturbed sleep, irritability of temper, quick pulse, and headache, which is generally increased by rising up more than by lying down. Palpitation and pain in the region of the heart, and difficulty of breathing, are also frequently induced by slight exertion or agitation of any kind.

It is obvious that the condition which has now been described must not only prove very distressing in itself, but tend to the production of other serious diseases; and, therefore, ought to be remedied with the least possible delay whenever ascertained to be present. A popular prejudice has existed against interference with bleeding piles, on the ground that harm may arise from suddenly checking an habitual discharge; but the worst consequences thus anticipated are hardly to be dreaded more than those directly sustained from the disease; and the result of experience is quite opposed to the apprehension of harm being so produced. In illustration of the safety with which the hemorrhage may be arrested, even when of the longest standing and greatest extent, I may mention the case of a lady, whom I attended with Dr. Donaldson of Ayr. At an early age she had begun to suffer from hemorrhoids, and thirty years ago had been advised by the late Mr. Benjamin Bell to have them removed. This was declined, and the disease went on increasing with all the usual symptoms, until at length the bleeding, which for seven or eight years had been very profuse, so affected the general health as to excite the serious alarm of her friends. She exhibited in an extreme degree the peculiar aspect and other symptoms of exhaustion caused by a continued drain of blood. But very soon after the removal of the hemorrhoidal tumours, which were large and numerous, so as to encircle the aperture of the gut, she regained her strength together with a healthy look; and though three years have now elapsed since the operation was performed, she has not suffered any unpleasant symptoms from the sudden suppression of her complaint.

The existence of bleeding from internal hemorrhoids frequently escapes the observation of the medical attendant, from the patient carelessly overlooking or wilfully concealing it. In females, the delicacy of the sex, which is an additional obstacle to discovering the disease, should excite corresponding vigilance on the part of the surgeon; and whenever there is any ground for suspecting its existence, be the patient male or female, an examination of the

bowel in its most protruded state should be insisted upon before giving any opinion of the case. It is also very necessary to beware that the symptoms, especially those connected with the circulation, do not obscure the nature of the disorder, and make it appear to depend on what are really its secondary effects. As an instance of this, I may take the case of a gentleman, about forty, an English commercial traveller, whom I saw last spring with Dr. Alexander. He had laboured long under what was supposed to be disease of the heart, and been treated for this complaint by one of the most eminent provincial physicians in England. His waxy look, bloodless lips, and defective energy, together with irregular action of the heart, certainly afforded considerable ground for this opinion; but Dr. Alexander discovered that there was an internal hemorrhoid, which bled profusely every time the patient went to stool, and I removed it, with the effect of quickly restoring him to health. There is reason to fear that in such cases as this the cause has not only been mistaken for the effect, but may even have been supposed to exert a salutary influence in moderating the violence of its action,—in other words, that the flow of blood from the rectum depended upon disease of the head or heart, and was useful in lessening its force. Such erroneous views may have led to the equally erroneous practice of abstracting blood artificially in these circumstances, the effect of which may be easily imagined.

The treatment of internal hemorrhoids is generally regarded with much uncertainty and apprehension, from the conflicting opinions of practical writers on the subject, and the disagreeable results of some methods which have been pursued. Excision is certainly the quickest and easiest mode of removing the tumours, but is very apt to occasion a serious or even fatal hemorrhage. The blood does not readily escape externally, but, accumulating in the rectum, excites the desire to go to stool, and is then voided in the form of a dark coloured feculent-looking fluid, which may impose upon the attendants, and conceal from them the true situation of the patient. Sir A. Cooper has related the case of a Scottish nobleman who perished in this way, and several other instances of the same kind. If other practitioners had been equally candid, we should doubtless have had more testimony as to the danger of this operation; and every surgeon who has practised it must have experienced more or less alarm. Before my own views were settled as to the best means of treating the disease, I on one occasion cut away an internal hemorrhoid, which was partially protruded, and found it necessary to employ manual pressure for several hours to restrain the bleeding that followed. In another case of the same kind, I succeeded in securing the vessels by ligature. In order to obviate this danger, it has been proposed to transfix the base of the protruded part with pins, to prevent the raw surface from being drawn within the sphincter until the bleeding ceases, or is arrested by ligature.[1] But it is to be feared that the hemorrhage, though prevented so long

[1] Salmon on Prolapsus of the Rectum.

as the part was kept tense by the pins, might occur after their removal, unless they were allowed to remain until the orifices were sealed up with lymph, which could not be done without the risk of exciting inflammation and constitutional disturbance.

Excision being thus objectionable, caustics of different kinds, and the actual cautery, have been employed for destroying the hemorrhoidal growth, and might possibly be so managed as to prove useful in doing so. But as these means are excluded from modern surgery for this purpose, and as there is another which perfectly attains all that can be desired in treating the disease, I may proceed at once to speak of it, namely, the Ligature.

By applying a sufficient number of ligatures to the roots of the tumours, they may be certainly removed without any danger of bleeding. But it has been alleged, that, instead of this danger, another not less formidable is encountered in that of inflammation, spreading from the strangled parts, and either terminating fatally, or causing extensive suppuration and sloughing in the neighbourhood of the anus. The seeming resemblance between the condition of an internal hemorrhoid, to which a ligature has been applied, and a strangulated hernia, makes it appear likely that this effect would follow the operation; but experience teaches, what a more careful analysis of the cases would lead us to expect, that the bad consequences thus anticipated do not really present themselves. In a strangulated hernia, the circulation of the protruded parts is not entirely obstructed, but merely impeded, so as to cause inflammation, with its usual local and constitutional symptoms, aggravated by the importance of the affected part; while a hemorrhoid subjected to the ligature is completely detached from any share in the vital action of the system, which, consequently, cannot be influenced by its condition. Accordingly, however similar the two cases may appear at first view, their results prove very different; and I feel warranted, after very extensive employment of the ligature, to state, that it may be used without the slightest risk of serious or alarming inconvenience.

In order to account for the bad consequences which Mr. Copeland and others have related as occasionally attending the use of the ligature, it will be sufficient to remark, that if the threads are not drawn tight,—if such large portions of the morbid texture are embraced by them as to prevent the degree of compression requisite for preventing altogether the circulation through the tumours,—or if the whole of the disease is not included, disagreeable effects may not improbably ensue. Sir A. Cooper has advised that the ligatures should not be drawn tight, with a view of lessening the pain caused by them. But, with all deference to his high and justly esteemed authority, I feel no hesitation in stating, that though the suffering of the patient may in this way be rendered less severe in the first instance, it will ultimately be much greater, as well as more prolonged, and attended with more danger of spreading inflammation, than if the strangulation had been completed at once. To obviate this objection, it has been proposed to cut away the tumours, im-

mediately after they are tied, close or near to the knot, which method, it is obvious, must be attended with another danger, since the ligature, when thus left unsupported, will be apt to slip off, and permit the vessels to bleed. If the threads are drawn tight they will not so readily quit their hold; but in this case no advantage can be derived from removing the strangulated parts, which then cease to maintain any living action, and very soon collapse into the form of flaccid bags.

I thought at one time that the best plan of proceeding with the ligature was to include at first only a part of the disease, with the view of avoiding any risk of exciting more irritation than the part or patient could safely bear; but I am now persuaded that by doing so much more pain and danger of undue excitement are occasioned than by the summary process of tying all the tumours at once. In illustration of this I may mention the case of an eminent provincial practitioner whom I attended with Dr. Abercrombie. He had long suffered from the bleeding of internal hemorrhoids, and was at length reduced to a state of extreme exhaustion. From being a strong muscular man, he had become a feeble emaciated invalid, unable for any exertion of body or mind, with the waxy look, frequent small pulse, and headach in assuming the erect posture, which characterise the state arising from continued depletion. As the tumours were large and numerous, I commenced the treatment by tying one of the smallest, with the view of ascertaining what degree of of freedom might be used with the remainder. The ligature separated at the end of two days, but the other excrescences swelled and protruded from the anus to the excessive distress of the patient, who described his sufferings as intolerable, and alarmed the neighbours by his cries. As his pulse suffered little alteration in frequency or hardness, and his belly continued free from pain, no great apprehensions were entertained as to the result. The inflammation accordingly did not extend beyond the limits of the diseased growth, the whole of which mortified and sloughed off, leaving the patient completely freed from his complaint, though at the expense of much more suffering than had been anticipated.

It is not difficult to explain why a partial operation should produce such effects. The morbid texture of the hemorrhoidal tumours, like all other formations not entering into the original constitution of the body, being hasty and violent in its disposition to excited action, readily inflames when injured, and suffers more acutely than the natural textures. The slightest excitement is apt to make it swelled and painful, and when it is partially subjected to a tight ligature, inflammation so intense as to destroy its vitality may be occasioned, while, if the whole be included the separation takes place, not indeed without some uneasiness, but certainly without any of a serious or alarming character. On the same principle any operation attended with local irritation in the neighbourhood of internal hemorrhoids, is apt to be followed by troublesome consequences from their excitement. A gentleman came

under my care for *fistula in ano* with this complication. I advised that both complaints should be remedied at the same time, to prevent the irritation caused by an operation for one of them, from injuriously affecting the other. The patient, however, persisted in requiring the fistula to be cut by itself in the first place, which was done, and followed by a very distressing paroxysm of the hemorrhoidal disease. He returned to the country to recruit his health, and came back some weeks afterwards to have the excrescence removed. Another patient came lately above a hundred miles to be operated upon for fistula, and made no mention of any other ailment. I performed the necessary incision, and a day or two afterwards was surprised to see a large internal hemorrhoid protruding from the wound. He then told me that he had long suffered from bleeding piles; and I expressed my regret that this communication had not been made sooner, as both diseases might have been remedied together, with less inconvenience than he was then subjected to. It happened fortunately that the inflammation proved so intense as to destroy the tumour, which sloughed off, so that the recovery was completed without any farther operation, but certainly, as in the last case, with much more pain and confinement than if the hemorrhoid had been tied when the fistula was cut. Still pursuing the same principle, when any pendulous folds of skin are observed to surround the anus in a case of internal hemorrhoids, I should advise them to be removed with the scissors at the same time the ligatures are applied, lest they inflame and prove troublesome in consequence of the neighbouring irritation.

When the operation is to be performed, the patient should take a dose of castor oil, so as to evacuate his bowels previously to it, as they had better not be moved for forty-eight hours afterwards. The hemorrhoids having been fully protruded by a sufficient degree of straining, the patient either stoops forward, resting with his arms on a chair or table, or, if a female, lies on one side, with the limbs drawn up, so as to expose the parts concerned. The surgeon then introduces the fore-finger of his left hand within the sort of ring which is formed by the morbid growths, and, keeping it there as a guide, transfixes their roots in succession with a needle and double thread, directing from without inwards through the centre of each, close to the base. The ligatures, which should be waxed silk, of proved strength, are next to be tied as tightly as possible, each, of course, including the half of a tumour. Their ends are then cut away as near to the knots as may be, without endangering their security; and the protruded parts are lastly pressed gently back within the sphincter.

The symptoms consequent upon the operation, vary with the extent of the disease, and the irritability of the patient. There is seldom much, or, indeed, almost any complaint of pain until the ligatures are tied; and the patient even then, in some cases, feels little inconvenience. The suffering which attends this step of the process, however, is in general considerable, and often very severe. It is most intense at first, and usually subsides gradually in the

course of a few hours, until the uneasy sensation is little or not at all perceptible. Want of sleep is frequently one of the effects produced, and is sometimes so distressing and prolonged, as to excite serious alarm. It is accompanied with nervous excitement, rendering the patient restless, more or less incoherent in his ideas, and wild in appearance. The pulse is seldom much affected, and when it does suffer disturbance, merely becomes quicker, without any of the hardness which denotes an inflammatory state of the system. The bowels are constipated, so as not only to cease evacuating their contents spontaneously, but to require laxatives of greater power than is sufficient in ordinary circumstances. Difficulty of making water, sometimes amounting to complete retention, and requiring the catheter to be introduced, very frequently occurs, but seldom continues beyond the first twenty-four hours. In two cases, I have found it last for nearly a fortnight. When the patient goes to stool a day or two after the operation, there is either no protrusion at all, or a much smaller one than formerly, and in general no bleeding. Little inconvenience is experienced after the unpleasant effects immediately consequent upon the operation have subsided, until the ligatures separate, which is usually about the end of a week; when a painful feeling is often complained of in the raw surface left by the sloughs, and a little blood is occasionally discharged along with the evacuations. Soon after this, the irritated parts regain their natural condition, and all the disagreeable symptoms which proceeded from the disease, as well as those caused by the operation, completely disappear.

Such being the consequences of tying internal hemorrhoids, the treatment after the operation may be easily determined. An opiate, containing thirty or forty drops of the solution of muriate of morphia, should be administered to the patient if he complains of pain, and be repeated from time to time if it continues severe, or a somewhat larger dose may be injected into the rectum with a teaspoonful or two of warm water. Fomentations may at the same time be applied to the anus. And if, notwithstanding the use of these means, much suffering is still experienced, the hip-bath of poppy-head decoction should be employed. The retention of urine, if slight, may be relieved by giving the *spiritus etheris nitrici*, or the camphor mixture; and if more obstinate, will require the catheter to be introduced occasionally as long as it lasts. The patient should restrict himself to the antiphlogistic regimen, and drink freely of simple diluents, such as barley-water or lintseed tea, to lessen the acrimony of the urine. He should also confine himself to the horizontal posture until the ligatures separate. In general, very little requires to be done in the way of treatment, the patient, after the first hour or two, usually suffering little uneasiness, and even then scarcely more pain than what attends the disease during its state of excitement.

CHAPTER III.

PROLAPSUS ANI.

By *prolapsus ani,* is understood a tumour formed by protrusion of the coats of the intestine through the anus. Such tumours consist either of the gut in its whole thickness, or of the mucous membrane alone, in a state of morbid development. Being thus differently constituted, they should not be confounded together, as they usually are, but be carefully distinguished, since they have no resemblance to each other, either in the nature of their production, or the treatment which they require. In making this distinction, it is fortunately unnecessary to employ any new names, since, if the title prolapsus be confined to denote those protrusions in which the whole thickness of the gut is concerned, the other forms of the disease may be all referred to the head of Hemorrhoids.

In this restricted sense, *prolapsus ani* consists of a tumour generally round or oval, but sometimes cylindrical, varying in size from that of a small egg to that of the largest orange, exhibiting the slimy surface of a mucous membrane, and affording a copious secretion, of very similar appearance to red currant jelly. It is obvious that the connections of the lower part of the rectum must prevent it from descending, so as to present these appearances, which can be accounted for only by supposing that the higher part of the gut becomes invaginated in the portion below it, so as to project beyond the anus. In short, the derangement will be the same as that which is named Intussusception, with this difference, that in the latter case the invagination occurs higher up the intestine, beyond the reach of sight and touch. It has been maintained by some, that the lower part of the rectum alone was concerned in the formation of prolapsus, the protrusion of this apparently fixed portion being accounted for by the relaxation of its coats. But this explanation does not agree with the anatomical structure, the phenomena observed during reduction of the protruded bowel within the sphincter, or the appearances which have presented themselves in cases that terminated fatally.

In regard to the causes of prolapsus, it is of importance to notice, in the first place, that the disease is almost entirely confined to children, and persons of advanced age who suffer from a relaxed state of the *sphincter ani.* In the former it is produced by long-continued or inordinate straining to evacuate the bowels; and in the latter, it results merely from want of the usual resistance to descent from the anus. The excessive expulsive efforts are induced by irritations of various kinds,—of which may be particularly mentioned, teething, intestinal worms, stone in the bladder, and morbid states of the mucous lining of the alimentary canal. Weakness of the sphincter is generally connected with deficiency of nervous energy in the pelvic viscera or lower extremities; but sometimes depends on a want of power confined to the muscle itself, which

either loses its contractile tone, or is impeded in its action by a relaxed state of the parts which it embraces.

The symptoms of prolapsus vary with the size of the part protruded, and the degree of vigour with which the intestine resents its unnatural position. They are therefore in general more urgent in young persons, and less so in old people. There is always more or less uneasiness in the protruded part, and obstruction to the evacuation of the bowels; and if inflammation commences, the sufferings of the patient become extreme, terminating even in his death, or mortification of the invaginated portion of intestine. Though the bad consequences are not always very rapid in their progress, the disease, if left to itself, can never be regarded as free from danger, and should, therefore, always be remedied as soon as possible.

The treatment of prolapsus resolves itself into the means required for replacing the intestine, and those employed for preventing a return of the complaint. In order to attain the first of these objects, the patient should be laid horizontally on his side or back, with the limbs bent upon the pelvis, and desired not to hold his breath, which, by confining the abdominal viscera, opposes the ascent of the gut. The surgeon then grasps the tumour in his hand, having previously lubricated its surface with oil, and, gently but steadily compressing its neck while at the same time he urges on the body of the swelling, gradually pushes the protruded parts within the sphincter. In most cases this reduction is easily accomplished. But when it has existed for several days or longer, the coats of the bowel become so much thickened and painful, that the manipulation requires to be conducted with great care and patience.

The prevention of relapse may be accomplished variously, according to the circumstances of the case. If irritation be the exciting cause, it must of course be removed; and for this purpose different means will be required, according to its seat and nature. If a stone in the bladder is the source of disturbance, it must be cut out; if ascarides in the rectum, they must be expelled by proper medicines; if it proceeds from dentition, the gum must be scarified, and the ordinary soothing means employed; and if it be connected with an unhealthy state of the mucous membrane, astringents, anodynes, and gentle stimulants of a proper secreting action, together with regulation of diet and regimen, will be necessary. While attempts are thus made to withdraw the source of irritation, the patient should be prevented, so far as possible, from voluntary straining, which is apt to continue through the bad habits which have been acquired. With this view, the bowels ought not to be evacuated in the sitting posture usually assumed by children in doing so, as it renders the pressure of the diaphragm most direct upon the contents of the pelvis; and the patient should sit upon a chair so high as to prevent his feet from reaching the ground, which will keep the trunk erect, and moderate the force of the expulsive efforts. Care also should be taken to prevent him from sitting too long or too frequently at stool.

In cases of the other kind, in which the protrusion depends not upon inordinate pressure outwards, but upon deficiency in the usual resistance of the sphincter, while it is equally proper to reduce the prolapsed bowel without delay, the means of prevention for the future must be of a different kind. There being here no local irritation in existence, of course nothing can be done with the view of removing it; and the treatment is consequently limited to preventing the patient from voluntary straining, and to increasing the resistance of the sphincter. Constipation of the bowels, which necessarily leads to long continued and laborious efforts at expulsion, should be carefully prevented by regulation of the diet and regimen; by the use of appropriate laxatives; and by the injection of tepid water into the rectum, which not only is a powerful assistant of medicines given by the mouth, but often proves sufficient to supersede their employment altogether. The enema syringe of Read, more convenient, perhaps, in its original form than any of the subsequent modifications which it has undergone, renders the administration of this means so easy and simple, that no difficulty need be experience in its habitual use. Every patient who suffers from constipation of the bowels, and more especially all those who have any tendency to prolapsus, should be provided with the apparatus.

When the weakness of the sphincter depends upon a paralytic state of the muscle little can be done for its remedy, and a bandage must be worn to support the rectum. But if the contractile power remains at all, though diminished by distension of the orifice, and impeded in its action by relaxation of the parts about the anus, the patient may frequently be relieved by a very simple operation. It consists in removing a portion of the pendulous skin which surrounds the orifice of the gut, and produces its beneficial effects, by relieving the sphincter from the obstruction to its efficient closure, which is caused by the presence of relaxed integuments, and by inducing consolidation of all the textures concerned, through the changes consequent upon the inflammatory action it necessarily excites. The source of irritation which, as has been already explained, is apt to proceed from the skin thus altered, is also in this way removed. Mr. Hey of Leeds removed the whole circle of pendulous skin. But M. Dupuytren found that the object in view could be equally well attained by taking away merely a few of the folds into which it is thrown when allowed to collapse round the anus. The scissors curved to one side prove most convenient for effecting this excision, and should be directed from the circumference towards the centre of the aperture. The folds of skin should be held tense by a hook or forceps, and be removed from the distance about an inch and a half quite up to the mucous membrane, a small part of which should be included in the incision. It is not necessary to remove more than four or five of the folds. Mr. Howship has recommended the ligature, instead of the knife or scissors, for this purpose, on the ground that it excites a more salutary degree of irritation. But the pain and delay attending its use would more

than counterbalance this alleged advantage, which may be compensated for by the freedom of excision.

In adults who are said to suffer from *prolapsus ani*, there is seldom any thing more protruded than the internal lining membrane of the bowel, more or less thickened or altered in its texture. The complaint, therefore, would be more properly designated internal hemorrhoids; and this correction of terms would prevent much confusion in practice, since, in such cases, instead of removing the morbid swellings, the treatment is in general erroneously directed to strengthening the sphincter, or supplying substitutes for it in the form of bandages. It is true that the symptoms may be alleviated by obviating constipation, using astringent applications and medicines, cutting away the folds of relaxed skin, or even by employing a bandage. But such treatment is merely palliative, and the relief is neither complete nor permanent; while, if the hemorrhoidal growths are recognised as the cause of the protrusion, it may be at once completely and safely remedied in the way that has been described; and the treatment of prolapsus, strictly speaking, will be confined to those comparatively rare cases in which the gut descends independently of any alteration in its texture.

CHAPTER IV.

POLYPUS OF THE RECTUM.

The rectum is sometimes, though very rarely, the seat of morbid growths from the mucous membrane, which resemble the tumours named polypi in other parts of the body. The extreme rarity of this disease may be estimated from the statement of Sir A. Cooper, that in the whole course of his experience he has met with only ten cases of it. He says that it generally occurs in children, and very rarely in adults, and that the most advanced age at which he has met with it was twenty-two. The few cases that have fallen under my own observation were in persons who had attained or passed the middle period of life. Except in cases where there is a general vegetation of morbid excrescences from the surface of the gut, and which are not, properly speaking, examples of the affection in question, polypus of the rectum always, so far as I know, occurs singly. The tumour is of a round or pear-shape, varying in size from that of a pea to the bulk of a hen's egg, and either smooth or lobulated on the surface. It has a narrow neck or footstalk, which is usually attached within an inch or two of the anus. In its consistence there is considerable variety, the texture being sometimes firm and unyielding, at other times soft, and hardly distinguishable by touch or ocular inspection from the lining coat of the bowel.

The causes which give rise to such productions are quite un-

known, since the difficulty of discovering the tumour while still small and recently formed, together with the want of frequent opportunity for observing its development and progress, throw much obscurity upon the circumstances attending its origin; but if successfully investigated, they would probably be found to consist in circumstances of an irritating nature.

The symptoms are similar to those of internal hemorrhoids, being a sensation of weight and uneasiness in the rectum, pain, and frequently a discharge of blood in going to stool, and irritation of the bladder and uterus. The footstalk is sometimes so long as to allow complete protrusion of the tumour beyond the anus, in which case its existence cannot be overlooked. But when it is retained within the rectum, a very careful examination with the finger is necessary for detecting its presence.

The treatment of course requires removal of the polypus, and this may be effected either by excision or by the ligature. There does not appear to be the same danger of bleeding from the former of those methods, as when it is employed for the extirpation of hemorrhoidal tumours, but there must always be more or less risk of unpleasant consequences from this source, and the ligature should therefore be preferred. In a case which I saw with Dr. Hilson, of Jedburgh, the tumour, which was about the size of a cherry, and appeared to have existed for upwards of twenty years, was attached to the posterior surface of the gut by a slender footstalk, long enough to permit its being readily protruded from the anus. A single ligature might have proved effectual, but, to make the strangulation as complete as possible, I passed a needle through the root of the growth, and tied each of its halves with a separate thread. The patient, who was a lady upwards of seventy years of age, recovered without any inconvenience. In another case, for which I am indebted to Mr. Craig, of Ratho, it was necessary to pursue a different method.

"In January 1835, Mrs. H. aged 44, was delivered of her ninth child. The labour was in every respect natural and easy, and she made a good recovery.

"On the 2d of April 1836, I was sent for to visit her, and upon my arrival found that she had had a very profuse discharge of blood from the rectum. She was pale and exhausted, with a small feeble pulse. As the bleeding had ceased, and I was unwilling to disturb her, I merely prescribed the horizontal posture and doses of acetate of lead, with Dover's powder every four or five hours. The quantity of blood discharged could not be accurately ascertained. I saw two common water-pots nearly full, the one with scybalous fæces and blood, the other apparently with blood. But she told me that more had been previously passed to the extent of inducing syncope. There was no return of the bleeding, and she made a good recovery.

"On investigating the nature of this case, I was informed by the patient, that for fifteen years she had been more or less annoyed by uncomfortable sensations in the pelvis, with pain in her back, loins,

and thighs: That some years ago, while pregnant, and within six weeks of delivery, she had had a similar bleeding nearly as profuse, after which she made a very tedious recovery: That during the births of her younger children, she had been sensible of an uneasiness in the posterior parts which was not formerly remarked: That when she strained at stool something frequently came down, which required to be returned; and that she had consulted a variety of practitioners for the complaint, without obtaining any relief.

"I could hardly think, as seemed to have been previously supposed, that the uterus was the seat of the disease, because her labour had been natural; because the menstrual evacuations were regular; and because when examined it was felt of the ordinary size as well as consistence. Suspecting that piles might be the cause of her complaint, I carefully examined the rectum, and in the hollow of the sacrum detected a large pendulous tumour attached to the gut by a narrow neck. It was lobulated on the surface, and in consistence resembled the placenta or lung. It could not be protruded. But this seemed owing rather to its size than the resistance of its root. Pulling it gently occasioned pain shooting through the pelvis. It was sensible to pressure near its origin, but not in its mass generally. Having no doubt that this polypus was the cause of all her suffering, I proposed its removal; and on the 18th of November, Mr. Syme effected this by applying a ligature round its neck. In the course of a few days afterwards the tumour sloughed away in different pieces, which did not permit its structure to be satisfactorily ascertained. After this her general health improved, and she was relieved from all the disagreeable sensations which had so long distressed her, and at length produced a serious depression of spirits."

Great credit is due to Mr. Craig for discovering the polypus in this case, since the consistence of the tumour, as recognised by touch, was so similar to that of the intestinal coats, that I could not satisfy myself of its presence, except by feeling the neck and tracing it into the body of the swelling. The ligature was passed by introducing it on the point of the finger, carrying it round the footstalk, and then withdrawing it by means of a hook.

CHAPTER V.

STRICTURE OF THE RECTUM.

The rectum, like the œsophagus, which it resembles in many other points of structure, size, and morbid derangement, is liable to stricture of two different kinds. In one of these there is merely contraction of the coats, with thickening and induration of their texture. But in the other there exists a morbid growth, attended with the symptoms, and prone to the changes, which characterise malignant degenerations of structure. Want of attention to this

very obvious and necessary distinction has often led to great misapprehension in regard to the nature of the disease, and serious errors of practice in its treatment. By some it has been looked upon as always admitting of remedy at an early stage, and by others it has been considered always incurable; while the good effect of introducing bougies in cases of the simple or non-malignant kind has encouraged those who supposed the stricture to be constantly of a carcinomatous nature, to expect benefit from the employment of pressure in the treatment of cancer occurring in other parts of the body.

Simple Stricture of the Rectum.—The simple stricture is seated very near the lower extremity of the rectum, a little within the sphincter, between two and three inches from the anus. It is here that the gut changes the direction of its course, and after following the curvature of the sacrum, makes a sudden turn outwards to its termination. There is thus formed a sort of angular projection by the posterior surface of the bowel, which may be supposed likely to increase when subjected to continued irritation of any kind, and at length to constitute an inconvenient degree of contraction. It has been maintained that this is not the sole seat of stricture in the rectum, and that the disease frequently occurs farther up the canal, especially at the distance of five or six inches from the anus. Indeed, some have gone so far as to profess their ability not only to recognise, but to treat it successfully when seated beyond the rectum altogether, in the sigmoid flexure of the colon. That contractions of the great intestine may occur in any part of its course, I do not mean to question. But that the thickening and induration of its coats are in such cases usually confined to the narrow limits which constitute a stricture in the ordinary acceptation of this term, or that the strictured part can be accurately ascertained, and efficiently dilated by the use of instruments, I have no hesitation in expressing my unqualified disbelief.

It is very natural for persons suffering from constipation to suppose that obstruction of the bowel is the cause of their complaint; and they are consequently ready to believe in the existence of stricture, when it is intimated to them by their medical attendant, especially if, at the same time, hopes of relief are held out from the employment of mechanical treatment by dilatation. There is too much reason to fear that unprincipled practitioners have taken advantage of this facility in the disposition of their patients to promote their own unworthy views. But I should be sorry to allege, that a want of good faith was requisite either for the discovery or the treatment of strictures high up the rectum. The practitioner is hardly less exposed to deception than the patient; and if he examine the rectum, under an impression that there is a stricture existing in it, he will be very apt to believe that he has found one. In the feeble and unhealthy persons who are usually suspected to labour under the disease, the coats of the rectum are so thin and relaxed as readily to catch the point of the bougie employed for exploring the cavity, and thus impede its progress, which is also

apt to be arrested by the promontory of the sacrum. As an instance of this, I may mention the case of an elderly lady whom I saw with Dr. Begbie. She had been supposed to suffer from stricture of the rectum, between five and six inches up the gut, and had been subjected to treatment for it during several years before coming under Dr. Begbie's care, by two gentlemen of the highest respectability in this city. Finding that the coats of the rectum, though greatly dilated, were quite smooth, and apparently sound in their texture, so far as my finger could reach, and conceiving that the symptoms of the case denoted a want of tone or proper action, rather than mechanical obstruction of the bowels, I expressed a decided opinion that there was no stricture in existence. Not many months afterwards the patient died; and when the body was opened not the slightest trace of contraction could be discovered in the rectum, or any other part of the intestinal canal. One of the gentlemen who had been formerly in attendance was present at this examination; and wishing to know what had occasioned the deception,—which he said had led to more than *three hundred hours* being spent by himself and colleague in endeavours to dilate the stricture with bougies,—he introduced one as he had been wont to do, and found that, upon arriving at the depth it used to reach, its point rested on the promontory of the sacrum. Other cases might be mentioned to illustrate the uncertainty of information as to the capacity of the higher part of the rectum, obtained by exploring the gut, and to show how far the best intentioned practitioners may be misled by the sources of fallacy I have endeavoured to explain.

If the symptoms of stricture of the rectum could be traced at an early stage of the disease, difficulty in evacuating the contents of the bowels would probably be their most remarkable feature. But the complaint almost always steals on insensibly, so as not to attract attention until fully formed; and then the inconveniences experienced are so different from what might be expected, that they tend rather to obscure than to indicate the nature of the complaint, which is therefore seldom suspected by the patient. There is at present in the hospital here, a woman who was admitted on account of a *fistula in ano*, in whom, on introducing my finger into the rectum, to guide the knife in dividing the septum, I found a stricture in the ordinary position, so tight as to exclude any thing larger than a moderate-sized urethra bougie; yet she had been quite unconscious of its presence, though the symptoms proceeding from it were extremely severe. The reason of this is, that the effects of a confirmed stricture are in general the frequent, often almost incessant, discharge of thin feculent matters, owing to the copious secretion of mucus which results from the irritation of the disease; and that the thin slimy stools, occasionally tinged with blood, attracting more notice than the small indurated masses of fæces passed along with them, make the case assume the appearance of diarrhœa. The mistake thus committed, not only prevents the proper means of remedy from being employed, but leads to the administration of astringents and anodynes, which must prove

hurtful, by checking the process instituted by the system for its own relief. This consists in the copious secretion of fluids into the cavity of the great intestine, which lessens the solidity of the feculent matters, and facilitates their passage through the narrow channel that remains for their escape. Being forced down upon the stricture by the violent efforts at expulsion, which are made to unload the distended bowels, a small quantity is urged through the stricture, and issues from the anus in a sudden jet, as if propelled by a squirt. The grand character of the disease in its advanced stage, then, is the frequent squirting out of thin feculent matters, containing no solid masses, or only very small ones, and mixed with blood or mucus, accompanied by a sensation of cutting or burning in the rectum. In addition to this, the abdomen is distended, partly by retention of its feculent contents, partly by tympanitic swelling, caused by derangement of the bowels. Pain also is felt in the sacrum, extending down the limbs; and abscesses frequently form in the vicinity, so as to lay the foundation of *fistula in ano*. In this case, the sinus does not, as has been alleged, open into the gut above the contracted part, but holds its usual position near the anus, and should be regarded rather as an accidental consequence of the neighbouring irritation, than as a direct effect of the stricture.

The disease is met with more frequently in females than males, and generally occurs about the middle period of life. It is extremely distressing; and, if not remedied, may at length prove fatal, by gradually exhausting the patient's strength, or exciting inflammation of the bowels. Some years ago, I attended a gentleman for *fistula in ano*, together with stricture of the rectum. Not long afterwards, he told me that his wife complained of symptoms similar to those he had suffered from the latter ailment. I proposed an examination of the rectum, which was declined, and I heard no more of the patient, until raised one night with an urgent request to visit her immediately. She was labouring under the symptoms of peritonitis in its advanced stage, and died before the end of many hours. The rectum was contracted almost to obliteration at the usual part. Instead of terminating thus abruptly and violently, the disease more frequently, when it proves fatal, gradually exhausts the strength of the patient, by the continued uneasiness, and derangement of the digestive functions, which attend it. Extreme emaciation and hectic irritation are thus induced; and unless some other disorder occurs to arrest his sufferings, he at length sinks under the complaint. The progress of such cases is by no means rapid; and the disease, after attaining a certain extent, often seems to remain stationary; so that there is usually ample opportunity for its discovery and treatment.

From the slow and insidious formation of stricture in the rectum, it is not easy to ascertain the circumstances which give rise to it. The analogy of what happens in other mucous canals, would lead to the supposition, that continued irritation of the gut is probably the immediate exciting cause. But the precise way in which this

state is occasioned, or why, when its other effects are so common, it should so rarely produce the effect in question, are points that have not yet been satisfactorily made out.

In the treatment of the disease, some temporary relief may be derived from injecting tepid water or oil into the rectum, to soothe the irritation of its coats, and facilitate the discharge of its contents. But as the patient, by such means as these, cannot be freed from his complaint, it is necessary to enquire how the gut may be restored to its natural capacity. Of the means employed to remedy strictures of mucous canals in general, namely, the caustic, the knife, and the bougie, the two last mentioned have alone been resorted to in treating stricture of the rectum. Division of the contracted part with a cutting instrument, notwithstanding the obvious risk of hemorrhage and inflammation incurred by doing so, has been occasionally practised; and with such speedy as well as complete relief, that some practical writers regard this method as the one which ought to be preferred. But as experience has ascertained that, in certain conditions of a constitutional and local kind, wounds of the rectum, even though of very small extent, are followed by serious or fatal consequences; and as the bougie, though not so speedy in its operation as the knife, is equally effectual, and not exposed to the same objection, prudence seems to require that the practice of incision should be either entirely abandoned, or only used in particular cases with extreme caution. The best instrument for the purpose, is the blunt-pointed curved bistoury; and the stricture should be either divided backwards, in the direction of the sacrum, or notched at different parts of its circumference by cuts of smaller extent.

The use of bougies in removing strictures, is a remarkable example of good practice, originating from false principles. It was at first adopted with the view of destroying the obstruction through the effect of medicinal substances, which were in this way applied to the contracted part of the canal. And when experience had proved that bougies of the simplest composition, as those constructed of metallic substances, were not less effectual than those of the medicated kind, the process of improvement was next ascribed to the mere dilatation acting mechanically as on a tube of dead matter. Hence it was thought impossible to introduce the instruments too frequently, or for too great a length of time. At least once a day was thought essential, and they were permitted to remain for hours at a time. But the contracted canal is not composed of dead substance, and the stricture depends upon a peculiar morbid action of the living texture. The beneficial effect of the bougie, therefore, must consist in the excitement of another action opposed to the one formerly in operation, and capable of restoring the gut to its natural state.

It is the effusion of organisable matter into the cellular texture of the part that causes the stricture, and it is the absorption of this deposit which removes the disease. The bougie, by effecting pressure, excites the action of absorption. And if the pressure be

too great, too long continued, or too frequently repeated, there will be a great risk of causing more than sufficient irritation for the purpose; and of inducing again the very condition it is desired to counteract, the consequences of which must be a confirmation and increase of the disease. The perfection of treatment by means of the bougie, may thus be considered to consist in using it merely to the extent requisite for producing its beneficial effects; and this is now fully ascertained to be much less than might at first view have appeared possible. Instead of requiring to be introduced daily, and to remain in the passage for hours, it appears that the bougie causes a sufficient degree of excitement if used every third or fourth day, and withdrawn immediately after being passed through the stricture. Under this system, the improvement not only advances at least as quickly as when the operation is performed more frequently, but is likewise much more sure in its progress, and much less apt to be interrupted by undue irritation of the part concerned. These principles now regulate the treatment of stricture in all the mucous canals which are subject to it—namely, the urethra, œsophagus, and rectum.

Rectum bougies are constructed of various materials; and from the facility of guiding them through the stricture, owing to its position in the vicinity of the anus, the composition of the instrument is of less consequence than when the disease is seated in the urethra or œsophagus. Metals, wood, glass, and cloth, made up with plaster or elastic gum, may be employed. But, on the whole, those formed of iron and elastic gum are the most convenient. The former are cheap and imperishable; the latter are more expensive and liable to decay, but perhaps more easily introduced and less hurtful to the feelings of the patient.

When the operation is to be performed, the patient should be placed upon his side, and then the surgeon, having in the first place satisfied himself as to the precise position of the stricture, by feeling it with his finger, passes a bougie, lubricated with oil or lard, up to the obstruction, and presses against it steadily but gently. If the resistance cannot be overcome without using force or causing pain, he withdraws the bougie, and tries a smaller one in the same way, thus proceeding until he gets one to pass through the contraction, immediately after which he withdraws it, and concludes the process for that time. If necessary, some soothing means, such as an opiate injection, or the hip-bath, may be employed to allay any undue irritation that has been excited, even by this cautious proceeding. At the end of three or four days, or a longer interval, if the patient continues to suffer from the former operation, the bougie which was introduced upon that occasion is again passed, and followed up by another of larger size; and thus the treatment is carried on until the disease ceases to occasion any inconvenience, and a full-sized bougie can be introduced with ease.

Malignant Stricture of the Rectum.—There has been some difference of opinion as to the comparative frequency of simple and malignant stricture of the rectum. From my own observation of

the cases that come under treatment, I should say that the latter is more often met with than the former. It generally occurs in the same part of the gut as the simple stricture, but is not so limited or regular in its extent. The diseased growth is sometimes confined to one side of the gut, at others it affects the whole circumference; and it is only in the latter case that there is stricture, properly speaking, though it is usual to designate by this title all morbid growths occurring in the coats of the rectum. The swelling is usually of a very irregular form, and seldom extends less than several inches along the gut. Occasionally it descends quite to the anus, or even shows itself externally, but more frequently it leaves the coats of the intestine free for an inch or two within the sphincter. The morbid growth generally possesses a moderate degree of firmness, and exhibits characters intermediate between those of carcinoma and medullary sarcoma. It encroaches on the cavity of the rectum, so as to impede more or less the evacuation of the bowels, and being attended with the symptoms which are wont to proceed from such degenerations, occasions great and almost unceasing distress. The patient complains of a shooting or fixed dull pain in the back, at the upper part of the sacrum, and extending down the limbs, together with a sense of weight and uneasiness in the part affected, especially after motion of the bowels, or the operation of any circumstances causing irritation of the disease. He passes blood and purulent matter along with his stools, which are thin and frequent; and though in the earlier stage of the disease, difficulty may be experienced in passing them through the thickened coats of the gut, there is for the most part ultimately rather an inability of retention from the action of the sphincter being impeded by the progress of the disease. His countenance displays the greenish-yellow complexion characteristic of malignant disposition in the system, and he loses flesh as well as strength. On examination, the gut is found not only contracted, but thickened and irregular on the surface. The coats at the affected part are hard and unyielding, and the morbid growth is felt projecting into the cavity, sometimes in the form of rounded tubercles, at others rough with ulcerated depressions. As these changes, judging from touch alone, do not differ, except in degree, from those which attend the simple stricture, it would often be difficult to determine, merely by local examination, the nature of the complaint. But the symptoms which accompany it are so well marked, that the disease can hardly be either overlooked or mistaken. In its progress, the patient becomes generally exhausted, and falls into a hectic state, which is soon followed by dissolution.

In common with other malignant affections, carcinomatous stricture of the rectum does not admit of being remedied by any kind of treatment directed with the view of restoring the diseased part to its natural state, and its situation forbids any prospect of benefit from removal by the knife or any other means.

In these circumstances, palliation is all that can be reasonably attempted; and for this purpose, opiate injections, with the hip-

bath, are very useful. The patient should be enjoined to abstain from every kind of stimulating food and drink, and also to avoid any exertion of body likely to aggravate the complaint, resting as much as possible in the horizontal posture. The introduction of bougies, and all other operations, not only can do no good, but must ever produce an injurious effect, by increasing the irritation of the disease, and accelerating its progress. It appears that a considerable portion of the rectum, even to the extent of a couple of inches, may be cut out without immediately fatal or any very serious bad consequences in the first instance. But the patient can experience no benefit from this being done, and, in addition to the pain of the operation, must have an impulse given to the morbid action. And if there are any cases in which this excision of the rectum has been followed by a permanent cure, the disease could not have been of a malignant nature. It may seem unlikely that so severe a proceeding should ever be resorted to except in cases the most hopelessly incurable by other means. But, so far from this, however startling and incredible it may appear, the fact is, that removal of the extremity of the rectum has of late years been taught and practised in this city, as the best mode of treating those hemorrhoidal affections which are generally comprehended under the title of *prolapsus ani*. That a complaint which, as has been shown above, may be certainly remedied with little pain, no danger, and without any injury to the natural structure, should give occasion to an operation so dreadful in its performance and effects, as cutting out the end of the bowel, together with its sphincter, is to be deeply regretted, as well for the credit of surgery as the good of humanity. It is needless to say that, after this extirpation has been performed, the healing of the wound is attended with an extreme contraction, I have heard even obliteration, of the gut; and the patient must consequently, like the victim of the ancient operation for fistula, suffer from the united miseries of constipation and incontinence.

It is possible that cancer may occur at the verge of the anus, as it does in the somewhat similar texture of the lip, and then excision may be practised without any impropriety. But cases of this kind are extremely rare, and should be carefully distinguished from those in which the coats of the bowel are implicated, where the knife can never be prudently or beneficially applied.

CHAPTER VI.

SPASMODIC STRICTURE OF THE RECTUM.

Cases are occasionally met with in which the patient expresses great suffering from uneasy feelings referred to the neighbourhood of the anus, though no alteration of structure in the parts concerned can be detected by the most careful examination. It is

stated that the bowels are evacuated with difficulty and pain,—that the pain frequently does not come on until after going to stool, and then continues extremely severe for an hour or longer;—that sitting is very uncomfortable, unless the body rests on one hip, so as to protect the anus from pressure,—and that there is an unpleasant sensation of fulness in the perinæum, with heat in the urethra, frequent desire to make water, or other symptoms of irritable bladder. These complaints are not always equally severe, and often become greatly aggravated, from time to time, with more or less complete remissions, which are not unfrequently preceded by discharges of blood or matter from the rectum. The anus, instead of presenting its ordinary conical appearance, looks flat when examined, and hardly presents any trace of the orifice, owing to the inordinate contraction of the external sphincter muscle. If the finger be introduced, which is not accomplished without great pain and difficulty, every attempt to examine the gut causing excessive distress, not only at the time, but for hours afterwards, it feels much more strongly compressed than usual. And when the nates are held aside, so as to bring the lining membrane of the anus into view, one or more ulcerated fissures are occasionally observed between its folds.

This affection occurs in every rank of life, but is almost entirely confined to the male sex. From not being attended with any obvious alteration of structure, it is often considered imaginary, and treated merely as a nervous complaint. It has only of late years attracted the attention of the profession, and is yet far from being familiarly known to practitioners in general. Boyer has given an excellent description of the disease under the title of Fissure of the Anus,[1] believing that the excessive contraction of the sphincter depended upon the irritation of the ulcerated chops, which he thus designated. That these two morbid affections frequently exist together there can be no doubt. But that the spasmodic stricture is of secondary origin,and dependent upon the other, is not reconcilable with the facts presented in practice. In a considerable proportion of cases, I have found the sphincter firmly contracted, without any perceptible fissure or abrasion of the surface. And I have also, though more rarely, met with fissures producing great uneasiness to the patient, but not accompanied with spasmodic stricture of the anus.

It is very difficult to explain the cause or origin of this complaint. Its nature leads to the suspicion of some chronic excitement or irritation of the parts concerned, or those in their neighbourhood. Anxiety and distress of mind have evidently a powerful influence in confirming and aggravating its symptoms, and may not improbably also occasion its commencement. General irritability of the system may also constitute a predisposition to

[1] De la Fissure ou Gerçure de l'Anus, accompagnée du resserrement Spasmodique du Sphincter; Traité des Maladies Chirurgicales, Tome x. p. 125.

its production. And every thing that tends to irritate the rectum is of course apt to increase the patient's sufferings. Thus, introducing the finger or foreign bodies of any kind within the anus—forcibly expelling indurated matters from the bowels,—using stimulating articles of food or drink,—and remaining long in a sitting posture, are observed to be hurtful.

In the treatment of this spasmodic stricture, it has been found that the most effectual, if indeed not the only, means of affording relief, consists in making an incision through the constricted parts. Boyer recommended this operation as essential for the cure of fissures at the verge of the anus, which he considered the cause of the contraction. And though his theory in this respect seems questionable, the advantage of the practice cannot be disputed. But the good effects of an incision are no less remarkable when there is merely contraction without fissure; and therefore, in a practical point of view, it is of little consequence how the two affections are supposed to be connected.

Boyer believed that it was necessary to cut through the whole thickness of the sphincter; and instructions for performing the operation to this extent have been given by many later writers. From my own experience, however, I am satisfied that it is not necessary to divide more than the external sphincter, or merely a portion of it, together with the lining membrane of the anus and subjacent cellular substance. The most convenient instrument for the purpose is a blunt-pointed straight bistoury, which may be guided on the finger with a sawing motion to the requisite depth. The incision should be made towards the side of the gut, and through one of the fissures, if there be any present. A piece of dry lint is the only dressing required after the operation; and the wound may be treated subsequently as if it had been made for a *fistula in ano.*

The following case affords a remarkable instance of this affection. I was asked to see a gentleman about sixty years of age, who stated that, a few weeks before, after sitting out a long debate in the house of commons, he had felt extreme difficulty in evacuating the bowels, having previously for several years experienced more or less uneasiness from this source; that he had consulted a physician and surgeon in London, who prescribed laxatives without affording relief; and that his complaint had continued so as at length to confine him to bed. I proposed an enema, which was at once objected to, on the ground that the anus would not admit the smallest sized tube. Suspicion being thus excited, the anus was examined, and found to present the characteristic features of spasmodic stricture. Having explained my views of the case, I gently insinuated the narrow sheath of a *bistoury caché*, which I happened to have with me, and then expanding the blade, withdrew it, so as to make an incision at one side of the orifice. A copious stool immediately followed and the patient was at once completely relieved from his complaint.

THE END.

ON THE

NATURE AND TREATMENT

OF

DROPSICAL DISEASES:

BY JONATHAN OSBORNE, M. D.

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INTRODUCTION.[1]

In the present edition this little work is enlarged, in order to embrace all the forms of dropsy which are usually entrusted to the care of the medical practitioner. As the treatment of this disease has been hitherto very generally conducted in a routine manner by the employment of one set of remedies, and without reference to the various affections which produce it, I have in the following pages embodied a concise account of all those diseases which are accompanied or followed by dropsical swellings; and have pointed out the different modes of treatment, which, in my experience, have been proved to be most successful.

If in my diagnosis of diseases of the heart I shall be considered by some to be far behind the advances made in this part of the subject, on account of my attaching only a secondary importance to the sounds, and my relying mainly on circumstances connected with the obstructions in that organ for the discovery of the valve affected, my reply is, that those circumstances have been to me the surest guides, not only in distinguishing the valve affected, but in leading to some more remote but not less important practical deductions. Under the article Ascites, a distinction is drawn between those cases which are the result of simple inflammation of the peritoneal surfaces of the liver, and those which, depending on alterations of structure in its substance, are in their nature obstinate, and to be acted on only by repeated and carefully conducted courses of treatment. The reader will find considerable stress laid on interposing intervals of rest, and total abstinence from the use of powerful medicines for the purpose of reinforcing the patient's vigour by appropriate means; the want of which has appeared to the author to have caused many cases, otherwise well managed, to terminate unsuccessfully.

In the account of Renal Dropsy, published in the first edition, I have nothing to alter; and am gratified at perceiving that the opinions advocated in it are very generally admitted and adopted. My subsequent experience

[1] On the Nature and Treatment of Dropsical Diseases: in Four Parts. Parts I. & II.—On Dropsies from Suppressed Perspiration and Diseased Kidney. Part III.—On Dropsies from Impediments to the Circulation. Part IV.—On Dropsies from Topical Affections. Second edition, with considerable additions. Small 8vo, pp. 134. London, 1837.

has confirmed their correctness. I have only to add, as accessory to the means recommended for procuring perspiration in refractory cases, a plan which did not occur to me till very lately, but which has succeeded after others had failed;—it is, the immersion of one of the extremities in the vapour bath for some hours every evening, and this for several days consecutively. When duly persevered in, I found that perspiration was at length induced in the one limb; and that, by continuous sympathy, it was soon afterwards spontaneously diffused over the entire surface with the effect of a complete subsidence of the dropsical swellings.

The number of cases from which the opinions set forth in this treatise have been derived is so great, that many volumes would be required for the publication of them; and in the present edition twenty-three are selected, merely for illustration of certain symptoms or effects of treatment. These pages, therefore, are not to be taken as containing the author's experience, but the results of his experience in an abridged form; and, in publishing them, he endeavours to discharge a duty to the public, which he contracted when he was placed over large hospital establishments: where as the opportunities for investigating disease have been supplied on the most extensive scale, so a corresponding value in the importance and accuracy of his observations ought reasonably to be expected.

Dublin, 26 *Harcourt Street*, 28*th April*, 1837.

PART I.

DROPSIES ACCOMPANIED BY COAGULABLE URINE, AND SUPPRESSED PERSPIRATION.[1]

It has been frequently observed, that dropsy should be considered rather as a symptom than a disease. Its occurrence in parts of the body previously sound, as a result of diseases of certain viscera, of debility, or of some impediment as to the functions of circulation or respiration, ought to have directed attention to the diseased actions believed to produce it, for information as to its nature and treatment. The classifications of dropsies hitherto adopted are about as rational and useful as would be a classification of diseases accompanied with excessive perspiration, under the title *ephidroses*. Such classifications, embracing various affections, are injurious, by investing with a name a combination which is only a mental abstraction, and which has no actual existence. The connection formed by including affections which happen to produce serous deposits, under the name *Dropsy*, has now begun to be dissolved. It is so well established that many of them arise from different and opposite states of the system, that in most cases enquiry is instituted as to the previous history of the disease; and few such affections are suffered to remain under the obscure denomination of dropsy, without some attempt being made to discover the *cause* of the serous effusion.

One kind of dropsy, however, has been suffered to remain longer

[1] From the Dublin Journal of Medical and Chemical Science. Jan. 1834.

under investigation than any other. It is not necessarily accompanied by any distinct local pain, and is not preceded by any disturbance of function, cognisable by ordinary observers, and it has been the work of many years to trace it to a diseased state of the kidneys. The first careful examination of the urine in dropsies was instituted by the late Dr. Wells. To him succeeded Dr. Blackall. Both these observers perceived that, in a great number of dropsies in which the urine coagulated by heat, there was evidence of inflammatory action, and that in such cases bleeding was productive of very marked benefit. Hence arose the class of dropsies designated inflammatory: and the practice with respect to these was much improved, and rendered more successful, by combining bleeding with diuretics; to which latter class of medicines the treatment had been hitherto exclusively confined. In addition to the cases adduced by Dr. Blackall, we have those recorded by Dr. Crampton, in the Memoirs of the Association, which prove the benefit derived from bleeding in some cases, which, until this mode of depletion was practised, were progressively approaching a fatal termination. Here, however, the enquiry rested, till Dr. Bright made the important observation, that coagulable urine was connected with a diseased state of the kidneys. Since the publication of his work, Drs. Gregory and Christison have brought before the public large collections of cases and dissections, which all bear testimony to the truth of Dr. Bright's observation. The cases of urine coagulating by heat, recorded by Drs. Christison and Gregory, were eighty-seven in number; and amongst those the granular deposit in the kidneys was always detected when examination after death took place. When these cases are added to the series of cases described by Dr. Bright, it must be confessed that they form a body of evidence to fix the pathology of an obscure disease, which merits the most serious consideration, in order to decide on the affirmative or negative of the proposition which they appear to establish. And yet, what has been their reception on the part of the profession? A few statements were made, which, even if taken in their full extent, are inconclusive, and the truth of the discovery has been obscured by doubts and hesitations, rather than controverted by facts or arguments. The facts produced in opposition, so far as I have been able to collect them from the article *Dropsy* in the Encyclopædia of Practical Medicine, and from Dr. Copland's Dictionary, are the following:—

1st. That coagulable urine has occurred in adults who appeared to enjoy good health, and also in children.

2nd. That in some persons it can be produced by taking pastry, or other indigestible articles of diet.

3d. That Dr. Darwall has adduced an instance of a woman who died from disease of the heart, and in whose lungs there were scattered tubercles, in whom the kidneys were found in Dr. Bright's first stage of disease, although the urine did not coagulate.

We shall consider these statements in their order:—

1st. The continuous secretion of coagulable urine by an indi-

vidual, who, notwithstanding, remains in the undisturbed possession of health and strength, would prove, either that the secretion was not the result of disease, or that, if so produced, the disease must be unimportant, and inadequate to the production of any sensible disturbance of the functions. Whether such an instance as this can be produced or not, it is impossible for me to say; but I may be allowed to state, that in a considerable number of trials I have not found one example; and experience enables me to assert, that many instances may be found of coagulating urine, which appear to be cases of health, but which an attentive examination would prove to be connected with disease. I may adduce, as a specimen, the case of a young man, who, about a year ago, had palpitations, and œdematous swellings, for which his medical attendant prescribed bleeding and other remedies, with good effect, and then sent him to the country for the restoration of his health: he was lately brought to town, preparatory to the resumption of his ordinary avocations. He made no complaint, the palpitations and swellings no longer existed, and he believed that all his ailments were at an end: but the eye of his anxious mother perceived that there was still something wanting to perfect health, and he was submitted to my examination. His appearance was healthy, his appetite and sleep natural, and the only circumstance which affected him was an anxiety as to the motions of his heart, in consequence of the opinion which his former attendant had entertained, of its being the seat of an organic disease. The heart's action, however, was natural: there remained then no complaint. I requested that a specimen of his urine should be brought, and, on observing its pale and cloudy appearance, tried it by heat, and found it to coagulate. Hence was opened a new field of enquiry; and it appeared that this young man, who, to a superficial view, would have appeared healthy, had a sensation of a dull weight in his loins, was in the constant habit of passing troubled urine, with dense mucous clouds, had dry skin, which never perspired except after the most fatiguing exercise, and altogether afforded complete evidence, that the kidneys were in the state which has been described by Dr. Bright.

It is true that in fevers, and other inflammatory diseases, an albuminous deposit is obtained on adding a saturated solution of corrosive sublimate. This urine is high coloured, and abounds in urea, yielding abundant crystals when treated with nitric acid, without requiring any previous evaporation. No coagulation, however, is effected by heat, unless it be so long continued at the boiling point, as to evaporate a large proportion of the water. There are also some individuals, who secrete constantly urine of this description, and in whom it may be traced to a habit of drinking very sparingly, by which a concentrated urine is produced. That a greater quantity of albumen in the urine is required to produce coagulation by heat, than by corrosive sublimate, is manifested by the following experiment:—I procured some urine secreted by an individual under these circumstances, which threw down an abundant coagulum to corrosive sublimate, but not to heat; and I found

that an addition of a fortieth of its quantity of serum caused a cloudiness barely perceptible, a considerable time after it had commenced boiling, and that nearly twice that proportion was requisite to enable it to form a coagulum. Thus it appears, that such a proportion of albumen as may coagulate with corrosive sublimate, may be consistent with health, but that the quantity producing coagulation by heat is so much greater, as to require a diseased state for its production.

The albuminous urine observed in children is very probably of frequent occurrence, which yet does not diminish the importance to be attached to it in the case of adults. The urine of children is at all times different from that of adults, in the proportion of its constituents. The quantity of urea and of uric acid is much less; and those are the deficiencies which are usually connected with albuminous urine in the adult. Hence we must not admit the value of albuminous urine as a symptom of a certain disease in the adult, to be diminished by the fact of the same being often secreted in infancy. The secretion is so different, that what is healthy in the adult would be esteemed morbid in the child, and consequently no comparison can be instituted between them.

2d. Here, however, we are met by the alleged fact, that certain healthy individuals are able, at any time, to produce a secretion of urine, coagulable by heat, merely by taking pastry, or certain other indigestible articles. Now this fact, if worth any thing as an argument, amounts only to this :—" Coagulable urine is not an indication of the presence of a certain disease of the kidney, because it may be produced by eating indigestible substances." In this proposition it is assumed, first, that the transient appearance of coagulable urine is the same thing as the continuous secretion of it, which alone constitutes the indication of the organic change of the kidney, of which we are treating; and, secondly, it assumes that this pathological phenomenon can only be produced in one way; and that, by showing that one way, it is proved impossible that it can be produced in any other. According to this mode of reasoning, we might prove that tenesmus is not an indication of dysentery, because it can be produced by aloetic purgatives; or that coma is not a symptom of apoplexy, because it can be produced by drinking spirituous liquors.

3d. Dr. Darwall's case of uncoagulating urine, in connection with the first stage of diseased kidney, as described by Dr. Bright, carries no weight as an objection. The first stage of the disease is with difficulty distinguished from the natural state, and is most likely to be confounded with, and appears almost identical with that paleness of the kidneys, spleen, and liver, which occurs in scrofulous cases. And this was evidently a scrofulous case; as appears from the presence of tubercles in the patient's lungs, as stated by Dr. Darwall.

Those are all the adverse facts which I have been able to collect. But I find, with regret, that by some this important discovery has not been resisted by facts, but depreciated by loose observations,

which deserve animadversion, when we consider the injurious effect which such may exercise on the progress of medical science, not so much with reference to this individual question, as to the investigation and settlement of medical questions in general. The truth of the statements made was not impugned; the extent of the field of observation—Guy's Hospital, and the Royal Infirmary of Edinburgh—has not been denied; the number of the observations recorded must have been admitted to be greater than has, within many years, been brought to bear distinctly on any one individual proposition in medical science. And yet all these circumstances were dismissed with the trite remark, that *further observations are required;* a remark which is as applicable to the discovery of the circulation, as to the question before us. By this remark we might throw an air of doubt over the best established propositions. It is so easily made, and, withal, so true when applied to every subject, that it is impossible to prove its impropriety. To this, however, has been joined the observation, that the writers, and the writers' friends, have not had opportunity to observe the connection, and, therefore, they do not only disbelieve it themselves, but call upon others to do so, without producing a *scintilla* of evidence whereon to ground our disbelief, except the fact that *they* have not had, or have not availed themselves of, the opportunities of examining the question by the test of a sufficient number of experiments. This must forcibly remind us of the village lawyer, who, when his client had been convicted of stealing a sheep, by the positive testimony of three witnesses who saw him steal it, replied, that that evidence went for nothing, inasmuch as he could produce many more credible witnesses who did not see him steal it. Thus, because those gentlemen have not seen the connection between coagulable urine and diseased kidney, we are not to be permitted to credit the evidence of those who have seen it; and all the facts before us,—the result of long and laborious enquiries on this subject,—are to be dismissed with the unmeaning, because universally applicable aphorism, that *further observations are required!*

The number of cases of coagulable urine which came under my notice, and the details of which, for reasons stated in the introduction, I have determined to omit, was thirty-six. Of this number examinations after death evince the disease of the kidneys in nine cases; while the remaining cases prove the existence of the same disease, so far as it is susceptible of proof, by similarity of symptoms, of cause, of collateral circumstances, and of *adjuvantia* and *lædentia;* and I can with truth aver, that I have witnessed many more cases which are not sufficiently detailed for the present occasion, but which, without any exception, corroborated the truth of Dr. Bright's proposition. The negative evidence in my possession is too copious to be detailed. It is, however, decisive as to the question at issue. It consists of numerous cases of dropsies, connected with diseased liver, impediments of circulation, or respiration, or general debility, which terminated fatally, in which the urine was examined before death, and found not to coagulate, and the

kidneys were found to be free from disease; also cases ending fatally, but unconnected with dropsy, in which the kidneys were healthy, and the urine did not coagulate. This evidence appears to me peculiarly valuable, inasmuch as during the last three years I have anxiously sought for every opportunity of examining the kidneys of every individual in whom the urine had been examined during life; and in no one instance have I met with coagulable urine without diseased kidneys, or healthy kidneys with coagulable urine. When I take this, my personal experience, in connection with the great number of cases recorded by Drs. Bright, Christison, and Gregory, very few even of the most generally admitted facts in pathology appear to be grounded on such a body of evidence. I have had under my care one case which may be esteemed an exception: in this the urine was rendered slightly turbid, and threw up a froth when heated to the boiling point. On dissection, the peculiar granulated structure was scarcely discernible; but one of the kidneys contained within its proper tunic, at its posterior surface, a mass of cancerous structure, presenting fungus hæmatodes, scirrhus, and medullary sarcoma, altogether about the size of half an orange. This mass did not extend to the pelvis of the kidney, but was closely connected with both the cortical and tubular structure, from which it was difficult to separate it without causing a rupture of the adjacent parts. This occurred in a case of chronic bronchitis and emphysema, terminating in œdema of the lungs, and was unaccompanied by any complaint of pain or uneasiness in the part. In the other kidney there was an unusual hardness of the mamillated extremities of the tubuli, and an indistinctness in the striæ, exhibited by them on a transverse section; the cortical structure of this kidney being very little altered from its usual appearance. In this case the slight coagulation was probably produced by the cancerous disease now mentioned, which, being closely connected with the interior of the kidney, caused irritation, and consequently a morbid secretion.

Some other combinations of circumstances deserve to be noticed. In a case of acute nephritis, in which both kidneys were filled with abscesses, and in which the urine contained a purulent deposit, there was no coagulation by heat; hence (so far as one case can prove) it appears that coagulation does not belong to suppurative inflammation of the kidney. In another case one kidney was filled with abscesses, and the other contained the gray granulation. In this case the urine corresponded to the state of both kidneys, by presenting a purulent deposit, and also coagulating. In a third case the substance of one kidney was entirely absorbed, being almost reduced to a bag, formed by its investing membrane and pelvis, in consequence of tumours formed within its ureter, which prevented the passage of the urine into the bladder, and by pressure caused absorption of its substance; whilst the other kidney was enlarged to double its natural size, and deformed in shape by a large deposition of the gray substance: and in this case the urine was light coloured, and coagulated.

It appears from the experiments of Dr. Christison, that the urine in those cases is of less specific gravity than healthy urine, and that the urea is always diminished; the quantity rarely exceeding one-half, and in some cases amounting only to a fifth of that in health, whilst he, at the same time, has proved its existence in the serum of the blood. This is confirmed by the observations of Prevost and Dumas, who found, in their experiments on animals, that when the kidneys were extirpated, urea appeared in the blood; thus proving that this substance is not *produced*, but merely *eliminated*, by these organs. When an injection is thrown into the artery, even in the most successful manner, it will not penetrate into the grayish deposit. The cortical portion of the kidney is the chief seat of the deposition; yet we sometimes find it filling up, and encroaching so much on the other part, that the tubular portion is limited to small, insulated portions; and in these cases the tubuli increase in density, and become more confused together, the nearer they approach their termination in the mamillated processes. In some of the most acute cases I found the lining membrane of the pelvis and upper portions of the ureters in a state of the highest vascularity, resembling crimson velvet. The changes produced on the size of the organ are remarkable, and in my observations appear to follow this rule, —that, in the more recent cases, the kidneys are enlarged beyond the natural standard; while in long confirmed cases they are reduced in size, and become hard in proportion; the cortical structure appearing to be removed, and replaced by the gray deposit.

The examination of the urine in this disease must be conducted according to one fixed rule, otherwise we shall constantly meet with apparent contradictions. The urine should be that which is passed in the morning before breakfast. It should not be examined till it has cooled. It then is usually of a pale citrine colour, semi-transparent or translucent, but not transparent like healthy urine; and at the bottom of the vessel there is an opake, whitish cloud, consisting of the mucus of the urinary passages, and differing from healthy mucus by its greater density and opacity; while in other cases it differs from the healthy state by containing no mucous cloud. On heating this urine, in a spoon, over the flame of a candle, white coagula are formed in those portions of the fluid next the metal, long before the heat has advanced to the boiling point: and when the heat is continued afterwards, the coagula become more firm and distinct. The lesser degrees of coagulability are signified by its not taking place till the fluid has boiled, or till some of it has been evaporated; by no coagula forming, and the fluid being rendered merely turbid; and, lastly, by throwing up a froth when boiled, which appears to be produced by the smallest quantity of albumen that can satisfactorily be tested by heat.

I may here mention, incidentally, that I use this mode of examining urine in other diseases beside dropsy, and without any expectation of meeting albumen. When urine with a copious sediment occurs, and it is desirable to ascertain whether it consists of uric acid and the urates, or of the earthy phosphates, I pour off the clear

urine, and heat in a spoon the sedimentous urine which remains at the bottom. If the sediment consist of uric acid and the urates, it becomes perfectly clear before the heat is raised to the boiling point; and the sediment is restored to exactly its former state on cooling. If the sediment consist of the earthy phosphates, no such changes can be produced.

The quantity of urine in this disease is variable, being not remarkable for scantiness, as is the case in other dropsical diseases. On the contrary, in most cases it is nearly equal to the drink, and in some cases exceeds it, approaching in this respect to the diseased secretion of diabetes.

The state of the skin is one of the most important facts connected with the disease. In all my cases perspiration was extinct, except in a few in which it occurred in the head, or in a transitory manner in the palms of the hands. When the perspiration was restored, in every instance a removal of the dropsical swellings immediately followed. As this part of the subject, however, leads directly to the plan of treatment which I have to recommend, and which differs from that hitherto adopted, I shall postpone this, along with the consideration of the other symptoms of this remarkable disease, to the next opportunity.

PART II.[1]

On a former occasion I stated the facts which appeared to me to prove that albuminous urine, when continuously secreted, ought to be considered as a symptom of disease of the kidneys. Since that time I have continued to enjoy the same opportunities of observation as before; and, though I have anxiously sought for evidence, either adverse or favourable to this opinion, I have not met with a single instance of urine coagulating in a constant manner, in which an opportunity of examination after death was afforded, that did not present the disease of the kidney; nor, on the other hand, an instance of the disease being found in the kidney after death, in which, on taking a specimen of the urine in the bladder, it did not coagulate. On a review of the notes of all the fatal cases I am also enabled to state, that the extent of the disease discovered after death has been, in every instance, in proportion to the degree of coagulation. Thus, when the urine only frothed on the application of heat, the kidneys, although gorged with blood, contained the gray, granulated structure exclusively in the outer portions of the cortical substance, and especially at the extremities of the gland; while in cases of complete coagulation, the entire cortical substance was filled, or rather superseded, by the deposition now mentioned, and

[1] Read before the College of Physicians, January 18, 1835.

the tubuli were both compressed and rendered indistinct. In some of the cases which have last occurred, I have also to mention that the emulgent veins were filled with a substance resembling the buffy coat of the blood, but of a curdy texture.

I wished to pause before bringing forward this second part of my observations, in order to be enabled to ascertain the precise effect of several remedial agents. I was much surprised to find that this disease, which last year and in former years had been so frequent, had now become comparatively rare; and consequently a greater delay took place than I had anticipated. During this summer and autumn, however, it has been nearly as prevalent as formerly. The fact appears to be, that chronic as well as acute diseases take place more in consequence of peculiar changes in the atmosphere, than from any other agency acting on our organisation. They, like acute diseases, occur epidemically, but move as it were in a larger cycle, and cannot be observed in a limited space of time; and hence their epidemic character has escaped notice. Those who have the charge of large hospitals will, however, be able to recall to their recollection periods in which chronic rheumatism, dropsies, chronic bronchitis, or diarrhœa, prevailed, as well as those which were signalised by the simultaneous occurrence of acute diseases.

I have been favoured by a communication from Dr. Barlow, of Bath, referring to a paper on dropsy with coagulable urine, published by him in the *Midland Medical and Surgical Reporter*, in May, 1832, which I regret not having seen. He has no doubt of the general truth of Dr. Bright's conclusions, and has considered him to have established the fact of a connection subsisting between organic disease of the kidney and coagulable urine. I am happy to bring forward, from so eminent a practitioner, this additional evidence, of which I was not aware when I wrote the first part of this paper. Dr. Barlow has had the kindness to mention the particulars of a case which appeared to him one of albuminous urine arising from a derangement, *only functional*, which I shall give in his own words:—"One of the earliest and most remarkable cases of the acute kind that I have met with, occurred in a hale, active man, who became a patient of the Bath United Hospital in May, 1830, for extensive dropsy of a highly inflammatory kind. The urine, when first tested in this case, coagulated by heat alone into a solid mass. By active treatment he got well, and was discharged in July. This man, a common labourer, has continued well ever since—in constant work; to which he would hardly have been equal, if organic disease of the kidney, such as Dr. Bright has described, had remained."

With the utmost deference to very high authority, I conceive that the above case is an instance of *merely functional disease.* The continuous morbid secretion, always presenting the same difference from the healthy state, and accompanied by effusions into the cellular texture, are evidences of *a change, not fugacious, but permanent;* and when the cure of such a case is obtained, there is as much evidence of an organic disease being cured, as when a

hepatitis, or gastritis, is brought to a successful conclusion. Although the highest acknowledgments are due to Drs. Bright, Gregory, and Christison, by whose extensive collections of facts, and laborious investigations, the connection between albuminous urine and disease of the kidney was first ascertained, (a connection which previously had been barely suspected,) yet the fact which they have established has not been at all examined with reference to the influence which it ought to have on the treatment of the disease, and has hitherto remained unproductive. In those cases, the urine differs from that of health, by the presence of a considerable portion of albumen, and by the deficiency of urea. The quantity of the secretion, however, is variable, being more frequently in the healthy proportion to that of the drink than diminished. This last circumstance, occurring in a great majority of cases, first led me carefully to observe the perspiration, and the state of the skin. The result of my observations has been, that this peculiar disease stands in an intimate relation with the suppression of the healthy discharge from the skin, its connection being so constant, that they may be fairly presumed to stand in the relation of cause and effect.

The force of the circulation in this disease appears to be depressed by the action of some specific agency not as yet ascertained. The surface and extremities are uniformly cold—the latter being either livid or pallid; and, on reviewing my collection of cases, I find that in all of them the pulse was low, undulating, and ranging from sixty to ninety, except when they were complicated with inflammations; and that in those cases it was considerably less frequent than usual.

The perspiration was either completely extinct, or confined to occasional breakings forth in the head or chest, the palms of the hand, or soles of the feet. The skin was dry and shining, harsh to the touch; and, on examining it with a lens, the usual eminences belonging to the orifices of the follicles were no longer to be found, and the orifices themselves were hardly perceptible, except when they appeared like black dots, in consequence of being filled with the residue of old secretions.

Whenever general perspiration came on, either spontaneously, or in consequence of medicine, then the cases always terminated favourably.

The suppression of the cutaneous discharge must be attended with important changes, if we consider merely its quantity as determined by several observers. And although there is a great difference in the results of their observations, yet they ought not to be passed over in our estimation of this, the most remarkable and most uniform circumstance connected with the disease.

According to Dr. Bryan Robinson, of this city, the perspiration is to the urine as 1340 to 1000 in youth, and as 967 to 1000 in old age.

Sauvages, who resided in the south of France, found that from sixty ounces of ingesta, were passed off five ounces of fæces, twenty-two ounces of urine, and thirty-three of perspiration.

Gorter, in Holland, assigned to the excretions nearly the same proportions; while Dr. Keill, of Oxford, found the perspiration to be less than the urine in the proportion of thirty-one to thirty-eight. This, however, was objected to by his cotemporaries as being the result of a too liberal allowance of wine, the diuretic effect of which is well known. According to Linnings, who made his observations in South Carolina, the perspiration exceeded the urine during the five warmest months of the year, but was exceeded by it during the seven coldest. In all these observations it was proved that the perspiration was most abundant in youth, and the urine most abundant as old age approached.

While those observations are sufficient to show the average proportion of superficial exhalation and of urine, in a state of health, they are incomplete in not determining the proportion of exhalation of the lungs, as distinguished from that of the skin. This latter deficiency was supplied by the experiments of Lavoisier and Seguin. These were principally performed by placing an individual in a bag of gummed silk, accurately fixed round his mouth. The difference between the ingesta and the sum of excretions, and the weight acquired by the bag, gave the amount of pulmonary exhalation. This experiment was varied in different ways; and the result was, that the cutaneous was to the pulmonary transpiration as eight to five. Although it is much to be desired that those experiments should be repeated, and although, even in the most skilful hands, much diversity of result would be the necessary consequence of the difference of temperature, of age, and of constitution, yet enough has been ascertained to prove that the fluid which is thrown off by the skin, in health, is to the urine, on the average, as ten to eleven. If the quantity of the cutaneous discharge is imperfectly ascertained, its chemical analysis is no less a desideratum. It is known to be decidedly acid, and to contain most of the fixed salts which are found in the urine; and when the water of it has evaporated, it leaves a deposit which is irritating to the skin, and in hot climates creates a necessity of constant ablution and change of apparel, in consequence of the acrimony which it acquires by heat. The sudden repression of this secretion in any given part of the body, is usually followed by an inflammation or excitement of some organ, or peculiar system of organs, according to the peculiar temperament of the individual. Thus cold water, long applied to the feet, will produce in one, inflammation of the conjunctiva, in another, bronchitis, and in a third, diarrhœa; or a partial draft of cold air, blowing on the neck, will cause in one cynanche, in another, inflammation of the schneiderian membrane, and in a third, rheumatism of the muscles of the neck, according as the individual has been rendered liable to these affections by previous attacks of them, or by peculiarity of constitution. When cold is applied over the whole surface in a continuous manner for some time, and no inflammation or general fever has resulted, then an increased secretion from the kidneys is usually observed, and the necessity of frequent evacuations of the bladder, during the

frosts of winter, has become proverbial, and is familiar to every one. When the suppression of the perspiration, however, instead of being transient, is rendered permanent, then permanent irritation of the kidneys is produced, and in the great majority of cases the result is the disease of the kidneys now before us; while in some comparatively rare instances, diabetes, and in others more numerous, chronic diarrhœa, with bronchitis, are the consequences.

On reviewing the causes of the disease in thirty-six cases, in twenty-two individuals it could be directly referred to suppressed perspiration. One of these was Thomas Leahy, a remarkably vigorous man, in his thirty-fifth year, of sober habits. It appears that he was inconvenienced by the excessive perspiration of his feet, and that, at the suggestion of a friend, he wore fuller's earth in his shoes in order to repress it. The effect was immediate. The perspiration ceased not only in his feet, but also in every part of his body. Diarrhœa soon came on; and, when this was subdued by appropriate remedies, universal œdema, with coagulable urine, succeeded. Although, under the treatment adopted, the œdema was removed, yet the healthy action of the skin was never restored, and I am informed that his dropsy returned. In another of those cases, the commencement of the disease was attributed to cold bathing; but the most frequent cause of it was remaining in wet clothes. As the excitement consequent on the suppressed perspiration takes place in the secreting portion of the kidney, and neither in the *tubuli*, nor in the membranes, no acute pain is perceived; and the patient is usually barely sensible of a weight in the loins, or of a thrilling sensation shooting down the thighs. Hence has arisen the obscurity which has attended the formation and establishment of this organic disease. The next frequent cause is the abuse of diuretic drinks and medicines. Of the thirty-six cases, ten occurred in confessed drinkers of ardent spirits. One of these was able to follow his trade, until the circumstances attending the fire at the Custom-house afforded him an opportunity of indulging his passion for liquor. After drinking whiskey out of his hat to an extent which he was unable to define, he lay on the ground in a state of insensibility till late on the following day; and in addition to dry skin, and urine frothing by heat, he exhibited a complication of ulceration of the larynx, enlargement of the liver, and violent neuralgia of one of the frontal nerves. Yet in this individual the perspiration was restored, and he was freed of the œdema, and much relieved in all other respects. The confessed drunkards in my list of cases are limited to ten; but if we could ascertain the truth respecting the mode of life of all our patients, there is no doubt that many more would have been added to this number.

Diuretic medicines also have appeared to me to be a frequent cause of the disease. Squills and diuretic salts, although of the utmost importance in many affections of the thorax, yet when long continued, as they often are after the true indications for their use have ceased, become the means of bringing such on again, by

producing over excitement of the kidney, and this disease as a consequence.

With regard to the influence of other diseases. Of the thirty-six patients, four were scrofulous; three laboured under pericarditis; and three under valvular disease of the heart. This last connection has been placed in rather a prominent point of view by Dr. Bright. In my cases, the two diseases appeared to be combined only by both being the result of one cause, namely, suppressed perspiration; and a great number of valvular diseases of the heart have occurred to me without any disease of the kidney, except the usual deficiency in secreting power; which, as a necessary consequence of impeded circulation, comes on towards the fatal termination of such diseases.

Of the thirty-six cases which came under my notice, two originated in the remarkable influenza which visited us in the spring of 1833. That epidemic was distinguished from most others by the following circumstances:—1st, The copious discharge of urine, which was observed in almost every instance, from the commencement to the termination. 2dly, The remarkable debility. And 3dly, The permanently pallid complexion which succeeded, and which in many young persons has continued, and thus deteriorated their appearance since that time. From those circumstances, it is to be apprehended that many of the cases of impaired health, which commenced after that influenza, were connected with suppressed perspiration, and that in them this peculiar disease of the kidney established itself. Besides the two cases now mentioned, I ascertained, in three or four cases of paleness of countenance after that influenza, that although unattended with swellings, yet the urine frothed on the application of heat.

Of the thirty-six patients, eighteen laboured under bronchitis, in different degrees of intensity; eleven had gastro-enteritic inflammation, denoted by thirst, vomiting, or diarrhœa; and the two diseases were, in six instances, combined in the same individuals. Thus it appears that nearly two thirds of the entire number laboured under inflammation of the mucous membranes. It is also to be observed, that in every case, before improved by treatment, the appearance of the mucus in the urine was such as belongs to irritations of the bladder and urinary passages, not forming a transparent cloud in the lower part of the vessel, as in health, but collected into dense opake flakes, and, for the most part, resting flat on the bottom of the vessel. The coexistence of those affections with the disease in question is best explained by this circumstance—that they are all the effect of the one cause, namely, *obstructed perspiration.*

The fatal cases amounted to nine; and of this number, four were amongst the confessed whiskey drinkers.

The mode in which death takes place, when the disease is not disturbed by complication with other diseases, is interesting, not only to the pathologist, but to the practitioner, who is thereby

warned of the fatal tendency of certain symptoms which otherwise should be disregarded. In almost all my fatal cases, when not complicated, it terminated life by the production of a low form of arachnitis; as was evinced by examination after death. This brought to light opacity of the arachnoid and fluid in the ventricles; the medullary fibres of the brain, however, being unusually firm and distinct. The invasion of this form of arachnitis was announced in the case of John Smith, (who laboured under pericarditis, with copious effusion into the pericardium,) by indistinctness of vision and moaning during sleep, by gradually increasing somnolence and depression of spirits; and on the day preceding his death, he had several seizures of general convulsions, and remained in a state of stupor during the intervals.

In the case of Anne Doyle, there was a large effusion into the right cavity of the thorax. About three weeks before death, she began to complain of sounds in her ears, resembling the ringing of bells. Although appropriate means were used to relieve the head, yet fits, with foaming at the mouth, insensibility, resembling that of epilepsy, and violent pains at the vertex, continued, with intervals, to her death.

In the case of John Hacket, aged five years, who also laboured under enteritis, and in whom were found several knots of *intersusceptio* in the intestines, death occurred suddenly, but was preceded by convulsive contractions of the right arm; and, in addition to opacity and adhesions of the arachnoid and fluid in the ventricles, there was a softening of the surface of the anterior convolutions of the brain.

In the case of Thomas Caffray, who had been relieved of the œdema, and of the most urgent symptoms of chronic bronchitis and emphysema, an imprudent exposure to cold, and subsequent excess in spirituous liquors, were immediately followed by diarrhœa and delirium; the function of respiration being nearly unaffected. Within three days from the invasion of those symptoms, he was found dead in his bed, having walked about the ward in a delirious state within a few hours of his death.

In the case of James Brown, who also suffered under pericarditis, the fatal event was preceded by a stupor of two days' duration.

In two cases, which came under my examination since writing the above, the patients sank under a low form of peritonitis, which came on a few days before death. Those instances show the tendency to inflammation of the serous membranes, which the disease always produces, and which has been attributed to the acrimonious principles of the urine being no longer eliminated from the kidneys, and consequently communicating to the blood the property of irritating the more sensitive structures through which it is circulated.

Death took place in Catherine Reilly and Miss E., both scrofulous cases, from general debility; in James Kenny, from bronchitis; and in Catherine Kavenagh, from pneumonia, with broken down structure of the lung.

Thus it appears, both from the causes as related in the history

of the individual cases, and from the average number of the accompanying affections, that this disease is connected more especially with suppressed perspiration than with any other known agency; but that it may also be produced by excitement of the kidneys from spirituous liquors.

Subsequent observations have convinced me that it is produced *in the most decided manner by a combination of both*, as when an habitual drinker is exposed to a long continued application of cold.

We now proceed to the consideration of the treatment.

A kind of dropsy was observed by Frank (de hom. curand. morb. S. 153), characterised by no deficiency nor depth of colour in the urine, and with a tendency to diarrhœa, which he found to be more than ordinarily difficult to cure. In this we recognise the peculiar disease before us, and, at the same time, its obstinacy to the old method of treatment. My attention was first directed to the peculiarity of the treatment required in this disease, by observing that certain diuretics, when their use was long continued, not only failed in producing increase of the urine, but were followed by a marked diminution, almost amounting to a suppression of that secretion. Having obtained possession of this fact, I separated the histories of the cases in which it occurred, and found them all to agree in presenting coagulable urine. Some few dropsical cases, without coagulable urine, in which diuretics did not take effect, certainly occurred; but these were connected either with impeded circulation, or extensive visceral affections. In such, *all* the secretions were impeded, and therefore they did not disturb the truth of the general proposition.

When I attentively considered the cases of dropsy with coagulable urine, published by Dr. Gregory, I very unexpectedly found them to coincide with my observations. On examination of them, as recorded in the *Edinburgh Medical and Surgical Journal*, it will be found that the most remarkable diminutions of the secretion of urine occurred after the administration of squills and cream of tartar; while in other cases, in which the treatment was principally confined to bleeding and purgatives, the greater proportion of success was obtained. And without meaning, in the slightest degree, to detract from the merit of the several physicians who treated these cases, the necessity of bringing forward the truth relating to the subject now before us, compels me to state the fact, that of their patients, amounting to eighty, forty-five died, being above one half; whilst among the thirty-six cases which I have treated conformably to the views which I have endeavoured to explain, there were only nine deaths, being one fourth.

When a patient was placed under my care, with general œdema, coagulable urine, and dry skin, I directed him to be kept in bed, in order to maintain warmth of the surface, which is usually disposed to be cold. It has happened frequently that, by external heat alone, an improvement, both in the quantity and quality of the urine, and a material subsidence of the œdema, have taken place. The first medicine ordered was usually a purgative; and in the choice of

this, in order to avoid ambiguity as to its mode of action, I abstained from the use of all those articles which are reputed diuretic—such as compound of jalap, or supertartrate of potash; and I generally employed the senna mixture. I then commenced a diaphoretic course, by administering foot baths, hip baths, or general baths; the last either of water or of vapour, according as they appeared to agree best with the individual case, at night at the hour of going to bed.[1] The patient also took at night, eight grains of pulv. jacob. ver. 4. of pulv. ipecac. c. opio, and ten grains of confect. aromat.

The usual drink was barley water. In case, however, of tendency to stupor, or headache, the Dover's powder was omitted, or given in smaller doses. In one case, in which no perspiration was produced by the above and other means, it followed the use of the following mixture:—R. Aq. acet. ammon. ℥iv., sulphur, subl. ℥j., vini ipec. ℥j., ext. opii aq. gr. ij., aquæ fœnic. dulc. syrup. sacch. empyreumat.[2] utriusque ℥ij., one ounce to be taken every hour.

When the vapour bath was not attended by perspiration, from want of reaction on the part of the patient, he was directed to take, while in it, two drams of tinct. guaiaci ammoniat; when, however, (as sometimes happened,) both vapour and water baths produced coldness of the extremities, they were discontinued. It is to be observed that the drops of moisture which are condensed on the surface of the patient's body, while in the vapour bath, are often mistaken for perspiration. The occurrence of the latter can only be determined by ascertaining if the skin becomes moist after the patient has returned to the bed, which should, in every case, be warmed for his reception.

When there was a continued tendency to coldness of the surface, unaccompanied by feeble action of the heart, the diaphoretic preferred, was tinct. guaiaci. ammoniat. ℥ij., sulphuris loti ℥j., mist. camph. oz. j., sp. piment. ℥ss.; or the following,—R. carbon. ammon. ℥ss., mist. camph. ℥vj., an ounce to be taken every two hours. In connection with these remedies, administered in the evening, with a view to procure a perspiration during the hours of sleep, warm applications were kept up during the day, and frequently a succession of bags of hot salt was maintained, when the heat of the extremities could not be otherwise preserved. When perspiration was restored in one part of the body, as in the trunk, but not in the limbs, the latter were rubbed several times during the day with an infusion of two drams of bruised mustard seed in

[1] I have seen that some practitioners prefer the employment of warm baths in the morning. But surely the less liability to cold, the greater tendency to perspire in every individual at night and during sleep, render the hour of going to bed the most expedient.

[2] The peculiar properties of treacle are better known to the common people than among the faculty. It is a popular remedy for cold, and when taken in quantity is a powerful diaphoretic, as I have often experienced. I know a healthy individual who cannot take more than a few tablespoonfuls of it, without undergoing a profuse perspiration.

distilled vinegar, with naphtha,[1] or some other suitable stimulating embrocation.

Having never failed in removing this kind or general dropsy, *whenever the entire surface of the body was restored to a perspiring state*, it is not surprising that I should bestow the utmost attention on this part of the treatment. In a great number of cases, and especially those connected with bronchitis, the patient took, three times daily, an ounce of the following mixture:—R. balsami copaiba, ʒj., gum Arab., ʒiijss., sacch. q. s. ft. emulsio. adde aquæ cinnamomi mist. camph. utriusque, ʒij. The use of this was first suggested by the appearance of the mucus in the urine, which in almost every case denoted irritation in the urinary passages; and in chronic bronchitis, with scanty and opake secretion, there is no more valuable remedy. Copaiba has been set down in the Manual of Materia Medica as a diuretic; but I never recognised this effect from it, except through its agency in diminishing irritation in the urinary passages. When given to patients who were kept under the influence of external heat, it always acted as a diaphoretic, and was peculiarly valuable in answering the indications usually coexisting in those cases.

Next in importance to the restoration of the function of the skin, and, indeed, in most cases expedient, as contributing to that great object, was blood-letting. It will be recollected that, in Dr. Blackall's work, and in the papers by Dr. Wells, and by Dr. Crampton, before the disease had been as yet traced to the kidneys, there was a considerable body of evidence to prove the advantage of bleeding in cases of dropsy with coagulable urine. The circumstances which appeared to me to afford the strongest indications for general blood-letting, were, 1st, the peculiar full and undulating pulse, which resembles that so commonly occurring in nephritis; 2dly, the coexistence of inflammation of other parts; 3dly, pain or weight in the region of the kidneys; 4thly, the appearance of blood in the urine. The blood drawn was not usually buffed; but the serum, in almost every case, was turbid, and especially, but not exclusively so, when the bleeding was performed within a few hours after a meal. In some cases, cupping or leeching over the loins was resorted to, when there were some of the indications now mentioned; but when general blood-letting was forbidden by general debility, or other circumstances. Counter irritation over the region of the kidneys is a practice which requires some caution in a disease attended with such languor of the capillary circulation, and in which there may often be danger of the formation of intractable ulcers. Yet the application of moderate-sized blisters to the loins is a very suitable irritant, and calculated to

[1] This liquid, (also known as pyroxylic spirit,) which is sold at the druggists, is highly volatile, and has a peculiar penetrating odour, to which the patient generally becomes reconciled. Its vapour has appeared to me to be advantageous in the cases of chronic bronchitis, with which this disease is so generally combined—the odour may be modified by the addition of camphor, ʒj. to the ounce.

promote the action of the diaphoretic medicines. The best mode of applying these is by lint, steeped in tincture of cantharides, and covered with oiled silk. This has the advantage of superior cleanliness, of quicker action, and of not tearing the cuticle. Those vesications may be dressed with iodine ointment,[1] or be healed rapidly by means of simple dressing, and thus a rapid succession of irritants be maintained.

With regard to purgatives: in many cases they were withheld, in consequence of the tendency to diarrhœa, which is so commonly observed in this disease. When purging, however, by the aid of medicine was required, those most frequently employed were the senna mixture, castor oil, or rhubarb and magnesia. It is probable that in some of my cases other purgatives, such as gamboge, jalap, or crystals of tartar, might have been administered with considerable advantage; but I refrained from them for the reason before stated. In the management of those cases, purgatives should never be allowed to interfere with the administration of diaphoretics. They should, therefore, be given early in the morning, in order that their operations may be terminated before the patient is placed under the effect of the diaphoretics in the evening.

Calomel was administered in large doses, when affections of the head came on. These, however valuable in rescuing the patient from a state of approaching coma, were yet followed by no benefit to the secretions of the skin, or of the kidneys; and I am induced to coincide with Dr. Bright in the opinion that mercury produces no beneficial result in this disease. It has also appeared to me to cause salivation in those cases with an unusual rapidity; an observation first made by Dr. Bright.

In two cases the general œdema was removed under the use of iodine (a grain and a half with three grains of hydriodate of potash dissolved in a pint of water, given in the day time). As, however, both those patients were kept in bed, and by means of external heat a restoration of perspiration had been effected, they cannot be adduced as evidence in favour of the action of iodine in the disease.

[1] M. Coster has reported cases of dropsy successfully treated by the following preparations of iodine, viz. hydriodate of potash six grains, iodine three grains, dissolved in one ounce of water, given in a dose of six drops, gradually increased to fifteen, in sugar and water; and by dressing vesications formed on the thighs with an ointment of half a dram of hydriodate of potash, iodine fifteen grains, and lard one ounce; also employing it in frictions to the soles of the feet and axillæ.

He has also made some curious experiments to prove the passage of the iodine through the different parts composing the animal structure. He injected a solution of starch into the bladder of a dog, and a solution of iodine into the rectum of the same animal. The urine in the former in a short time acquired a blue colour. He also injected the iodine solution into the rectum, leaving the bladder empty; in this case a blue colour was produced when the dog passed his urine into a vessel containing starch. (Journ. de Phar. Nov. 1834.) I am obliged to state that I have not as yet been able to detect iodine in the urine of those who have been taking it, although I have not been unmindful of Dr. Clendenning's suggestion.

The object which I had in view in using it was to ascertain how far it would act in causing absorption of the morbid structure developed in the kidney. During the time of the residence of those patients in the hospital, the coagulability of the urine diminished very much, but did not disappear altogether; its colour and transparency were, however, completely restored. Had they been content to have remained longer under the treatment, it is probable that a total absence of albumen in the urine might have been witnessed. In the majority of the other patients, dismissal from the hospital took place when the same degree of improvement had occurred in the urine, but before a total disappearance of albumen had been obtained; and as soon as the œdema was removed, the patients generally thought themselves cured, and became anxious to leave the hospital as soon as possible.

Individuals who have been thus relieved from dropsy by a restoration of the functions of the skin, are liable to relapses if exposed to cold, so as to produce a return of the cutaneous obstruction. Hence they ought to wear flannel next the skin, and to make a timely use of baths and frictions, in case of dryness of the surface recurring. For those in affluent circumstances a residence in a warm climate cannot be too strongly recommended. If the muscular forces permit, exercise should be used till the effects of it are perceived on the skin; and, as œdema of the legs may recur, in consequence of the previous distension and subsequent relaxation of the cellular texture, it is expedient to wear bandages on the legs, until the ordinary vigour of health has for some time been established.

The diseases which were complicated with this affection have already been enumerated. The peculiar treatment which those complications required I shall now endeavour briefly to describe.

When combined with bronchitis, the use of copaiba, as already mentioned, appeared of the most decided advantage. In dry bronchitis the following mixture usually caused free expectoration:— R. Gum. ammon. gum. arab. sacchar. alb. singul. dr. ij. Bals. copaib. dr. ss. aquæ cinnamomi, oz. iv. A teaspoonful to be taken every hour and a half. In some instances in which the copaiba produced nausea, it was superseded by the tincture of cubebs, a medicine which, although totally differing from it in botanical and chemical relations, yet agrees with it in medical as well as sensible qualities. When expectoration continued to be copious for a long time, without any benefit resulting therefrom, and the principal distress arose from its quantity impeding respiration, then, in conjunction with the diaphoretic course, the administration of acetate of lead, one grain, and watery extract of opium, quarter of a grain, four times daily, caused a diminution of expectoration, and, at the same time, diminution of irritation in the air passages. The application of leeches externally to the larynx, the number varying from two to eight, is a most important part of the treatment of bronchitis. The good effects of it are not confined to the larynx, but are apparent also in the unloading of the mucous membrane of the bronchial

tubes throughout their entire extent, causing a more immediate cessation of cough, and relief of dyspnœa, than any remedial measure which I have had an opportunity of employing. In addition, blisters should be applied to the upper part of the sternum, and under the axillæ. I have generally used also, in these cases, frictions to the back, and sides of the chest, with the stimulating embrocations already mentioned applied several times daily. Under the use of these and other similar applications, I have frequently had the satisfaction of believing not only that the bronchitis was at an end, but that portions of emphysematous lung were restored to a healthy state. If asked for the evidence of this latter fact, I answer, that regions of the thorax, which had an unnaturally clear sound on percussion, and yet no audible respiration, or which presented the dry crepitus, and clear sound of emphysema, were, when subjected to this treatment, found gradually to resume the respiratory murmur of health, while the peculiar dyspnœa, characterised by longer expirations than inspirations, was at the same time removed, or notably diminished.[1]

When irritations of the stomach or bowels occurred, they were met by nearly the same treatment as if the disease now before us was not present. Leeches placed over the affected organ, with warm applications externally, and a diet consisting of rice, or arrow-root, frequently removed them in a few days. A tendency to dysentery, which is one of the most frequent forms of this complication, and which commences by tenesmus and general excitement, was most speedily removed by an enema of four grains of nitrate of silver, dissolved in eight ounces of distilled water, followed in three hours afterwards by the starch enema, with tincture of opium. The first is retained only a few minutes, but the last generally remains several hours, and the irritation is then at an end. Although the efficacy of these measures, no doubt, depends much on the promptitude with which they are applied, yet they have been found not to fail even in long protracted cases of chronic dysentery, when aided by other appropriate treatment.

When combined with pericarditis, the internal use of tartar emetic, in addition to topical and general blood-letting, produced a great increase of urine, with amendment of all the symptoms; while a decrease occurred on two several occasions, in which it was for a time superseded by squills. In valvular disease of the heart, and, especially, imperfect closure of the aortic valves, the patient, in addition to the diaphoretic treatment, took a mixture of a small quantity of tincture of digitalis, with carbonate of ammonia, camphor, and Hoffman's liquor. This combination was intended to act as a sedative to the heart, and, at the same time, as a stimu-

[1] It will be recollected how traumatic emphysema of the cellular texture under the skin is often absorbed with facility; and there is no reason why emphysema of the lung, caused by rupture of the air vesicles from violent coughing, may not, in like manner be absorbed, when once the coughing has been stopped. And yet emphysema has been considered as incurable, and no treatment beyond palliatives is usually applied to it.

lant to the circulation through the capillaries. Whether it acted in this way or not, may be questioned; but it was certainly followed by warmth of the extremities, diminution of the violent action of the heart, a sense of general relief, and a capability of sleeping with comfort at night.

The measure, however, which appears to me of the highest importance in diseased aortic valves, is the establishment of a large issue over the region of the heart. On some future occasion I shall bring forward some faithfully reported cases, which prove that organic disease of the valves is capable of great amendment, if not of complete cure, by this and other counter irritants, aided by the administration of suitable internal remedies.

General œdema, with coagulable urine, and obstructed perspiration, is not unfrequently accompanied by effusion of serum into the peritoneal cavity. This, when not considerable, or of long standing, disappears along with the general swellings. When, however, ascites has formed either in consequence of chronic peritonitis, or induration of the liver, then, although the general swellings have been removed, we have still to deal with a refractory, and often intractable complaint. In addition to the means which are usually adopted, viz. courses of mercury and purgatives, I am enabled, from experience, to suggest some other measures, to the employment of which I must attribute the fact, that within the last four years I can recollect only one case in which tapping was performed in my hospital wards, while previously it was a frequent operation. These are the repeated application of leeches to the rectum,[1] so as to unload the vessels of the vena portæ. The applications of various stimulants to the abdomen, as 1st, an ointment composed of equal parts of iodine, mercurial, and cantharides ointments. 2dly, A paste formed of Spanish soap, spread upon linen, and sprinkled over with muriate of ammonia immediately before being applied; which, by the chemical decomposition that ensues, and the consequent gradual extrication of ammonia, produces heat and redness; 3dly, Sinapisms, suffered to remain till the pain becomes urgent. These have the advantage of healing with great rapidity. 4thly, Frictions of six or more drops of croton oil. These are, however, rather uncertain; in some individuals producing no effect, and in others followed by erysipelas, extending beyond the seat of the application. 5thly, A mixture composed of one part of tincture of digitalis, and two of aquæ muriat. calcis; a teaspoonful to be rubbed on the abdomen, morning and evening. This compound appears to excite the absorbents, and increases the discharge from the kidneys, but does not produce any sensible redness of the skin. The application of these counter irritants and excitants of the absorbents may be continued, when the administration of mercury and of drastic purgatives has become no longer advantageous, or indeed

[1] In the *Dublin Medical Journal* I have described a convenient mode of introducing leeches into the rectum, by securing them with silk threads attached to the grooves of an instrument prepared for the purpose.

safe. It is certain that by these latter remedies the distension of the abdomen may frequently be diminished to a certain extent; but beyond this it is extremely difficult to proceed. Whenever the peritoneum has engaged in the process of morbid secretion, and the cavity of the abdomen has remained distended a certain length of time, it obstinately perseveres in retaining a certain quantity of fluid. The urgent and continuous use of the powerful remedies now mentioned, in such cases, is then not only abortive, but sooner or later causes irritation and ulceration of the bowels; and the patient sinks in consequence. It is therefore preferable, in those refractory cases, when the swelling no longer diminishes under the employment of internal medicines, to abstain altogether from their use for a time, and to rely on the application of counter irritants and bandages, together with regulated courses of diet, and changes of air, until the patient's vital forces are recruited, so as to enable us to make fresh efforts to dislodge the fluid.

When noises resembling the ringing of bells in the ears, wakefulness, delirium, stupor, or headache, come on, then, if there is increased heat of the head, blood must be taken either from the temporal artery, or by means of leeches applied to the temples, or behind the ears. Calomel must be freely given, and followed by brisk purgatives. If those symptoms continue, it will be necessary to apply sinapisms to the nape of the neck, and to persevere in the use of mercurials. These symptoms, which are always of formidable import in dropsies, and peculiarly so, because usually neglected, and erroneously supposed to belong to the disease merely as symptoms, may, under this treatment, be very generally averted; and it would be acknowledged, from an examination of the fatal cases recorded in my table, that, though the patients died immediately from the affection of the brain or its membranes, yet in most, if not all of them, peculiar circumstances existed, which had the effect of disarming the remedies now mentioned of their usual powers, and which, in those particular instances, rendered the disease necessarily mortal.

In conclusion: the observations which I have been enabled to make on dropsy with coagulated urine have appeared to me to prove,

1st. That it is always connected with disease of the kidney, which, when sufficiently advanced, is marked by the deposition of a grayish structure, impermeable to injections, within the substance of that organ.

2d. That the suppression of perspiration is the most general cause of this disease; and the long-continued excitement of the organ by spirituous liquors, or diuretics, the next in order of frequency and importance.

3d. That the most successful treatment consists in the restoration of the functions of the skin; which being accomplished, the disease, if free from complications, never fails to be removed.

4th. That bleeding and purgatives are also suitable remedies; while diuretics are either injurious, or, if removing the swellings

for a time, tend ultimately to cause a return of the disease, under a more aggravated and intractable form.

The constancy with which either this disease or diabetes is preceded by a continuous repression of perspiration, renders it expedient that this state of the skin should be considered as a peculiar disease; for which purpose it may be called *Anidrosis*. The use of forming this designation, is, to direct the attention of practitioners to a morbid state, which escapes observation because not signalised by pain, but which is not only a disease in itself, but leads to many other and fatal diseases.

CASES ILLUSTRATIVE OF RENAL DROPSY.

Case I.—*Renal Dropsy—Pneumonia—Arachnitis—Death.*

Henry M'Mahon, aged 38. October 29, 1834. Anasarca of lower extremities; cough, and general soreness in the chest; pulse 84, soft; obscure crepitus heard throughout both lungs, especially in right, and some dulness on percussion; no perspiration, and states that it has always been difficult to make him perspire; appetite diminished; tongue rather dry in the centre; occasional diarrhœa; *urine coagulating by heat almost into a solid.*

Present symptoms came on about five weeks ago, and are attributed to wet feet. He confesses to have been addicted to drinking whiskey. On his arrival in hospital, two days ago, he commenced the use of the warm bath, and the swellings have diminished. Mittant. sang. oz. viii. R. Sulphuris dr. i. pulv. Jacobi veri gr. vi. pulv. Doveri gr. ii. syrup. sacch. emp. oz. i. confect. aromat. gr. x. ft. bolus ter in die sumendus. 30th. Blood buffed and cupped. 31st. Appears stupid; pulse 72; omitt. bolus abr. capill. vesicat. pone aures. Mist. sennæ camph. ad effectum. Nov. 1. Sleeps constantly, except when roused; pulse 60. Mitt. ex arteria temp. sang. oz. vii. vesicat. amplum occipiti. Enema terebinth. mist. cardiac. oz. i. o. h. calomel gr. iv. quartis horis. 3d. He was roused for a few minutes after the blood was taken, but died in the evening.

Necroscopia.—Kidneys enormously enlarged, and filled with granulated structure, especially at their lower part; the tubuli almost extinct, except at the upper portions; the grayish structure projecting at the outer surface of the kidneys in roundish masses; renal veins filled with clots of a grey colour; lungs engorged, and in different stages of pneumonia throughout their whole extent; effusion of copious mucus into the bronchiæ; old adhesions between the pleuræ; brain highly vascular towards the left parietal bone; veins much congested; no collections of fluid at the surface or in the ventricles.

Case II.—*Renal Dropsy—Tuberculated Lungs—Skin obstinately obstructed—Enteritis Arachnitis—Coma—Death.*

Susan Stedman, aged 20. Dec. 17, 1835. General œdema;

skin dry; extremities cold; thirst; some cough. No disease of the lungs to be detected by auscultation. Catamenia absent during the last six months; pulse 70; urine coagulating by heat. The swellings commenced in her feet about two months ago. 25th. She has been bled, has taken James's powder and calomel, with the turpentine draught occasionally. As the extremities continued cold, she got the cardiac mixture (a compound of camphor, carbonate of ammonia, and Hoffman's liquor), and had bags of hot salt kept to her extremities. The swellings are now much diminished, and the extremities maintain a better temperature, but no perspiration has taken place. R. Sol. iodinii fort. oz. iiss. tinct. capsici oz. ss. *m.* Infricetur oz. ss. lumbis ter in die. Cont. mist. card. Hot salt to be applied. 31st. Swellings continue to decline. Sum. sulphuris dr. iss. ter in die. Cont. cæt. 8th. Appears stupid. Hirud. viii. temp. elect. jalap. ad effectum. 9th. Stupidity diminished. Enema fetid. Semicupium. cal. gr. iv. h. s. mist. sennæ c. *m.* 11th. No effect from purgative medicine. Tenderness of abdomen; stupidity less; vesicat. abdomini. R. Cal. pulv. Doveri utriusque gr. iii. *m.* tertiis horis sumend. mist. rosæ cathart. oz. iss. secundis horis ad effectum. 17th. Gums have become sore, and a good operation has been obtained from the camphorated senna mixture, after the failure of several others. Appears more lively; pulse 96. 18th. The stomach very irritable, retaining only saline draughts. Stupidity returns, with heat of head. Vesicat. nuchæ, haust. eff. 19th. Pulse almost imperceptible; stupidity; stomach still irritable. A poultice on the stomach; cal. gr. iii. tertiis horis; sinapisma capiti. White wine whey. 21st. Stupidity continues; face flushed; complains of pain in the region of the heart; pulse 120. Stomach now quiet. Thirst. Dej. 2. Urine scanty. R. Tinct. digital. gutt. iii. in haust. efferv. secundis horis, cont. calomel. vesicat. abdomini. 22d. Vomiting has returned. Dejections passed involuntarily. Is sensible, but very weak. Soda water and almond emulsion for drink. Cont. calomel. 23d. Urine passed involuntarily; tongue dry, brown; bad sleep; pulse 120; black dejections. 24th. Died last night.

Necroscopia.—Subcutaneous cellular tissue universally distended with serum; effusion of serum into right pleura and pericardium; heart very small; valves all perfect. In the right lung, at the apex, a large tubercular cavity communicating with a bronchial tube. Smaller cavities adjacent to it. Both lungs, except the lower portions of the inferior lobes, filled with small round tubercles in various stages. About two quarts of serum in the peritoneum; that membrane thickened and opake. The liver easily broken down, resembling a spleen. Mesenteric glands enlarged. Kidneys large; cortical substance filled with granular structure, and not containing a trace of blood. A strong urinous odour was perceived from them. Mucous membrane of intestines of a greenish white colour. Brain, between the dura mater and arachnoid, more serum than in health, and still more in the sub-arachnoid tissue. Slight congestion in the vessels of the pia mater at the left side anteriorly. But little

effusion into the ventricles. Medullary substance rather darkish; brain in other respects sound.

CASE III.—*Renal Dropsy in an incipient stage—Removed under treatment.*

Thomas Johnston, aged 53, shoemaker, admitted Nov. 3, 1833. Œdema of face and ankles first observed about ten days ago. Urine limpid, almost devoid of mucus, frothing on the application of heat. Skin dry; pulse 60, lingering and weak. Appetite, &c. natural; but during the last three months has suffered from distension of the stomach after eating. Drink 2½ pints. Urine 3 pints daily. R. Tinct. cubebæ oz. ss. mist. amygdal. oz. viiss. *m.* oz. i. tertiis horis. Ordered to keep his bed. 4th. On examination with a lens, the papillæ of the skin are shrunk. Perstet. 8th. Swelling diminished. Some perspiration after a bath last night; pulse 84. Cont. mist. bal. tep. alternis noctibus. 16th. Œdema gone. Diarrhœa, with some tenesmus, has come on. Pulv. Doveri gr. x. h. s. cont. cæt. 18th. Enema amyli. 20th. Bowels now free from irritation. 27th. Urine now no longer froths on the application of heat. Dismissed free from complaint.

CASE IV.—*Renal Dropsy at first aggravated by diuretics—Removed under treatment—The perspiration not restored.*

Bridget Flynn, aged 65, widow. Nov. 8, 1833. Universal œdema; urine coagulating by heat; severe cough; translucent expectoration; pulse 82; bronchial sounds in the chest; decubitus easiest on the right side; is frequently obliged to sit up; no perspiration; drinks about four pints in the day, and passes five; bowels habitually confined; catamenia long since extinct; duration of complaint two months; commenced on recovery from the influenza. Mist. sennæ camph. ad effectum. Hot salt to be kept constantly applied to the abdomen. R. Pulv. Jacob. ver. gr. x. pulv. Dov. gr. iv. confect. aromat. scr. ii. *m.* ft. bolus vesperi et nocte sumendus. 11th. Sleeps better. 12th. Skin continues obstinately dry; swellings rather increased. Sol. gambog. alkalin. gutt. xx. secundis horis ad effectum; enema terebinth. pil. cal. et scill. ter. in die; omitt. cætera. 15th. Swellings increasing; no effect from the drops; haust. tereb. mist. cubebæ et amygdal. R. Vini ipecac. tinct. cubebæ utriusque oz. ss. bicarb. ammon. dr. ii. aquæ menth. oz. vii. sum. oz. i. cum succi limon. oz. ss. omni hora; omitt. cætera. 18th. Œdema declining; cough better; no perspiration; haust. terebinth; urine coagulating as before; perstet. 25th. Swellings nearly gone; was dismissed in a few days.

CASE V.—*Renal Dropsy removed by treatment.*

Michael Donoghoe, a drayman, aged 38. Admitted August 27,

1836. General anasarca; swelling and fluctuation of the abdomen and scrotum; slight cough, with saltish expectoration; some dyspnœa, and tenderness of epigastrium; urine of the usual quantity, coagulating by heat; skin dry; pulse, tongue, and appetite, natural; bowels regular: complaint of one month's duration; attributed to a severe wetting; commenced with dyspnœa, chilliness, headache, nausea, thirst, and a constant wish to pass urine, which was at first diminished and turbid; was bled eight days ago; confesses to have been addicted to spirituous liquors. Admov. cucurbit. lumbis et mitt. sang. oz. x. R. Sulphureti potass. gr. x. sulphureti antimonii gr. ii. syrup. empyreumat. oz. i. *m.* ft. haustus ter in die sumendus. 29th. No sensible effect observed from the draughts; swellings diminishing; vesicat. ii. lumbis. R. Olei tereb. oz. ss. gambogiæ gr. i. *m.* sum. statim; cont. cæt. 30th. No effect produced on the bowels; urine increased; camphorated senna mixture; cont. haustus. 31st. Swellings steadily declining; cough and dyspnœa much diminished. R. Sulphuris lot. dr. ii. aquæ fœnic. dulc. oz. v. sp. amm. aromat. dr. ii. syrupi croci dr. vi. *m.* sum. oz. i. ter in die. 7th. Swellings entirely gone; skin now warm, but not perspiring; has been obliged to take the senna mixture occasionally; yesterday and to-day complains of headache; vesicat. pone aures. 8th. Headache gone; was dismissed in a few days. N. B. He was kept constantly confined to bed till within a week of his dismissal.

Case VI.—*Renal Dropsy with accompanying enteritis, bronchitis, and arachnitis—Perspiration restored—Disease removed.*

Eliza Levy, aged 18. Admitted Oct. 21, 1834. Universal œdema; skin dry; extremities cold; urine coagulating; mucous deposit lying in form of a flake at the bottom of the vessel; appetite defective; great thirst; tongue dry towards the tip; pulse 108. Duration of present symptoms three weeks. Was partially removed, but has come on to its present extent within the last four days; cause not ascertained. R. Pulv. Jacobi ver. gr. viii. pulv. Doveri gr. iii. conf. aromat. scr. i. *m.* ft. bolus h. s. sumendus; bal. cal. vesp. For drink, barley water. 23d. Urine increased; no perspiration. R. Aq. acet. ammon. oz. iv. sulphuris loti dr. ii. vini ipecac. dr. ss. syrup. empyr. oz. ii. aq. fœn. oz. ii. *m.* sum. oz. i. secundis horis. rept. bal. omit. bolus. 27th. Extremities warmer; swellings diminishing; appetite improving; perstet. 29th. Œdema of face has recurred; camphorated senna mixture; bal. vesp.; cont. mist. 31st. Skin warmer; œdema of face stationary; no perspiration; mittant. sang. oz. x. R. Carb. ammoniæ gr. ii. pulv. Jacobi ver. gr. x. sulphuris scr. i. confect. aromat. scr. i. *m.* ft. bolus h. s. sumend. bal. h. s. infus. lini lb. iii. in die. Nov. 2d. Some perspiration last night, but confined to the head; blood buffed and cupped. 3d. Repeat bolus; bal. vaporis. 5th. Anorexia; pulse 130. Pulsating sensation in the head; some perspiration after the vapour

bath; haust. efferv. omni hora; omitt. cætera. 6th. Pulse 120; heat of skin; epistaxis this morning; hirud. vi. temp.; cont. haust. efferv. Head to be shaved, and cooled with an evaporating lotion. 8th. Thirst, diarrhœa, headache, sleep interrupted by dreams; pulse 116; vesicat. ii. pone aures. hirud. xii. regioni ventric. mist. acet. plumb. oz. i. secundis horis. Enema amyli. cum opio h. s. urgent. diarrhœa. 10th. Diarrhœa diminished: dreams continue; mitt. sang. oz. xii. cont. mist. plumbi. Hot salt to the feet. 11th. Blood buffed and cupped; pulse 128; sleep improved; perstet. 12th. Headache continues; mitt. ex art. temporali sang. oz. x. cont. mist. 13th. Rep. arteriotomia. vesicat. nuchæ. 15th. Head now relieved; severe cough has come on; vesicat. sterno; cont. mist. 16th. Hirud. vi. laryngi. 20th. Cough continues; diarrhœa gone; pulse 120; nausea; thirst rep. hirud. et mist. 22d. Headache and cough much better; perspiration occurs at night on the chest and arms; pulse 116; bronchial sounds in both lungs; urine transparent, frothing, but not coagulating; rep. hirud. laryngi. R. Bals. copaibæ dr. i. muc. gum. Arab. oz. iv. sacch. alb. q. s. *m.* ft. emulsio; adde tinct. opii vini ipecac. utriusque dr. ii. aquæ cinnamomi oz. iii. *m.* sum. coch. med. omni bihorio. Dec. 1st. Cough and diarrhœa have entirely ceased; appetite returns. 11th. Swellings gone; no perspiration within the last few days; bal. cal. vesp. R. Pulv. guaici scr. i. pulv. Jacob. gr. viii. pulv. Doveri gr. ii. syr. empyr. oz. i. *m.* ft. haust. h. s. sumend. 12th. Thinks that she perspired. 23d. R. Tinct. guaic. Ammon. dr. iii. sp. pimento dr. i. mist. camph. syr. empyr. utriusque dr. vi. *m.* ft. haustus post bal. cal. sumend. 24th. General perspiration after the bath. 29th. Dismissed free from complaint.

PART III.

DROPSIES PRODUCED BY IMPEDIMENTS TO THE CIRCULATION THROUGH THE HEART, OR THROUGH THE LUNGS.

1. *Impediment at the mitral opening.*—This may arise either from defective action of the valves or from narrowing of the orifice, and both of these are occasioned by adhesions or ossific deposits. The symptoms of both are nearly the same, but more intense in narrowing of the orifice. They are as follows:—1. Palpitation and oppression of breathing on exercise. 2. Dull sound on percussion, chiefly in the region corresponding to the auricles, *i. e.* upwards and towards the left mamma. 3. A sensation resembling

that communicated by the vibrations of a saw, or of a file, when the hand is placed on the heart; and a sound resembling the same, or rather that of a bellows, when the naked ear, or the stethoscope is applied. 4. Cough, with more or less bloody expectoration, and the other symptoms of pneumonia; and along with these, large discharges of blood not unfrequently occur in consequence of pulmonary apoplexy, which is almost exclusively produced by disease of these valves. 5. The patient lies with most ease on the right side, or forward towards his face. 6. The pulse is not necessarily affected till the passage from the auricle into the ventricle has become difficult, then it is small and weak; and in proportion to the same difficulty the extremities become cold and œdematous. The face is frequently swollen at rather an early period, and before the real seat of the disease is suspected. Intermission or irregularity of the pulse, as they do not depend on mechanical obstruction, but on debility of the organ preventing it from maintaining its accustomed rhythm, either may or may not be present, and they are not to be taken as diagnostic of this, or of any other valvular disease of the heart.

In enumerating the above symptoms as strictly belonging to obstructed or permanently opened passage, from the auricle to the ventricle, at the left side of the heart, I am guided by a review of a great number of cases, and dissections, and am anxious to impress on the mind of the reader my conviction, that they are sufficient to enable him to form a diagnosis of the disease. The sounds of the heart have been too exclusively dwelt on by most writers, since the time of Laennec, while the peculiar symptoms occasioned by the mechanical derangements of the circulation have been in the same proportion neglected. By some the sounds alone have been thought to diagnose affections of the aortic or mitral valves, according as they accompanied the long or the short vibrations of the heart; but as they may be produced as well by the fluid regurgitating backwards as by its passing forwards, it is impossible; and besides who ever hears those sounds accompanying the short vibration, unless when also heard with the long one?

Imperfect aortic valves have appeared to me long since to be the most frequent of all diseases of the heart, belonging to advanced life, and to hold in this respect the same rank as emphysema in the lungs, and softening of the brain, do as climacteric diseases, which in the great majority of those who have survived the affections arising from the various noxious influences to which we are all subject, are destined to terminate their present state of existence. Those valves which, when the ventricle relaxes after its contraction, prevent the regurgitation of the blood from the arterial trunk, are so adjusted that at this time they are distended into the shape of cups, while the small triangular space in the centre of them is closed by the corpora aurantia. A very minute deficiency in their size is followed by an escape of some fluid back into the ventricle. This deficiency may be caused first by dilatation of the heart, rendering the orifice too large to be closed by the valves; secondly, by

thickening of the valves, and consequent retraction of their margins; thirdly, by rupture of a valve; fourthly, by ossific deposits projecting within the orifice, and thus preventing their contact. The consequences are the same. Regurgitation of blood takes place after each contraction of the heart; the left ventricle is unduly distended; violent action is the consequence, and thus not only dilatation, but hypertrophy is induced, and the symptoms now to be enumerated are the necessary result of this state.

The symptoms of imperfect aortic valves are: 1. Bounding[1] of the

[1] This appearance has been to me a source of much perplexity, and the value which I attach to it, being founded on facts, which may appear to some uncertain, the attention of the reader is requested to the following particulars:—First. There is a great difference between bounding of the larger and smaller arteries with regard to the cause producing it. I this day examined the wrists of the gentlemen of the clinical class, all of whom were in the enjoyment of youthful vigour and good health. In eight out of nine of them then present, there was bounding of the radial arteries. The individual who had not the bounding, although remarkably muscular, yet has an unusually small pulse, and in him it can be produced in the temples by exercise. In all persons it is much more evident in summer than in winter; and in cold weather it often becomes imperceptible. Second. Bounding of the brachial artery cannot be produced by any exercise, however violent, in those who have it not when at rest. Third. Of a number of patients in the hospital in summer, who had bounding of the radial arteries, there were four who had also bounding of the brachial and subclavian arteries, and in all of these there was evidence of disease of the heart, viz. palpitations on exercise, dull sound around the cardiac region, or *bruit de soufflet*. Fourth. In every case which has been under my care since my attention has been attracted to the subject, (*i. e.* within the last six years.) in which there was bounding of the larger arteries, when terminating fatally, and examined after death, some imperfection of the aortic valves, necessarily producing regurgitation from the aorta into the heart, was detected. The imperfection of those valves which is most apt to escape notice is thickening, which to superficial observers appears to be the natural structure; and I have seen reports of dissections, in which this great mistake must have been committed. A good mode of ascertaining the healthy state of the aortic valves, is by comparing them with the valves of the pulmonary artery in the same individual. The latter are so rarely diseased, that they may in the great majority of cases, be appealed to as specimens of the healthy state, and almost closely resemble the aortic valves in the healthy state.

It is to me subject of regret, that I am unable to illustrate the connection between regurgitation and bounding of the larger arteries by experiment. On injecting into the aorta a warm fluid of the consistence of the blood with a large syringe, and by a powerful arm, in jerks so as to imitate the contractions of the heart, no visible pulsations could be produced in any artery, and only a faint pulsation resembling that occurring in a low fever could be felt by the finger, but could not be perceived by the eye. Thus I was disappointed in my expectation of establishing by experiment what I believe is the fact, that in order to produce bounding of the brachial and subclavian arteries, there must not only be increased action, but also regurgitation.

Arteries in bounding are turned aside from the straight line and describe a greater number of curves. This is a necessary consequence of their elongation from the additional blood rushing into them, their extremities being fixed points. In the healthy state this only takes place in the smaller arteries to which the impetus from the heart ultimately tends; but when imperfection of the aortic valves exists, then not only is the bounding of the smaller arteries greatly increased, from the increased impetus of the more capacious

larger arteries. 2. A dull sound on percussion, extending across the lower part of the sternum to the right side. 3. Exercise producing a feeling of distress, distinctly referred to the region of the heart, and not connected with respiration. 4. A sound resembling that of a bellows, often more audible in the larger arteries, and especially in the right subclavian, than in the heart; sometimes perceptible to the hand applied over the heart, when it cannot be recognised by the ear; sometimes entirely absent, but when loudest then denoting ossific projections on the valves. 5. Increased action of the heart, and preternatural strength (not quickness) of the pulse; the force of the pulse being always remarkable even when not increased under the excitement of exercise. It is also to be noted, that in some rare cases when the heart has attained an enormous size, the motions of it cannot be perceived either by the hand or the ear, a state which is perhaps to be attributed to the compression exercised on it by the pericardium and surrounding parts.

Œdema and coldness of the extremities are more early attendants on disease of the mitral than of the aortic valves. The mitral valves are effected by far more frequently in females, while men are more subject to disease of the aortic valves. The cause of diseased mitral valves in all the cases in which I was able to trace it, was inflammation from cold contracted in various ways; and to this may be attributed the frequent occurrence of disease of those valves along with pericarditis. The causes of diseased aortic valves are more numerous, and are as follows:—1. Inflammation from cold, producing a thickening and consequent retraction of them, or else ossific depositions. 2. Severe muscular exertions causing dilatation at the orifice of the aorta, or rupture of the valves, and sometimes both combined. 3. Pressure from without on the region of the heart.[1] 4. Chronic bronchitis and emphysema of the lungs, which when long continued, cause difficult transmission of the blood. In protracted cases of this kind, a careful examination will often detect considerable breaches in the membrane forming the valve, and sometimes its edges appear as strings separated from the rest. Those morbid changes have hitherto been very much overlooked, from the prevalent notion that ossification is the only disease to which the valves are liable.

Diseases of the valves of the right cavities of the heart are exceedingly rare. I have seen only one instance of diseased valves of the pulmonary artery. The consideration of them therefore may be omitted in a practical point of view.

and hypertrophied heart, but a new phenomenon, namely, bounding of the larger arteries, (entirely quiescent in the healthy state,) takes place in consequence of regurgitation into the heart. In this case the bounding takes place in both lower and upper extremities, and it thus occurring in all the arteries is a proof that it must be derived from the heart.

[1] Shoemakers rest the last on the sternum towards the left side, and tailors in this country constantly stoop forwards at their work. Both are peculiarly liable to diseased aortic valves.

With regard to the treatment—I would premise that as the valves are part of the living system, they are not to be considered as beyond the restorative powers of nature. There can be no doubt that they are furnished with absorbents, and that as they are subject to disease, so they are also capable of curative processes. Hence it appears, *à priori*, possible that counter-irritants, and remedies which have the power of exciting absorption, should cause favourable changes in the structure of those valves, and consequently in their mode of action. In order to ascertain whether this actually took place, in several instances I carefully abstained from the use of internal remedies, and for a time confined the treatment to the application of leeches and blisters on the region of the heart. The effect was in every case, except those of old date, decidedly beneficial. In many, dropsical swellings disappeared, and sleep was restored within a week, with an increased fulness and softness in the pulse, which in those individual cases could only be explained by a greater facility in the transmission of the blood through the heart having taken place in consequence of the re-establishment of a more complete action of the valves. As those measures are applicable to every case, and do not interfere with any others in the treatment of these diseases, to them the first place must be assigned. Blisters may be applied almost immediately after leeching, by covering the leech bites with small pieces of paper, or adhesive plaster. After those have been some time in use, it is most expedient to place an issue or seton over the heart, which, although inferior to the former, yet when once established, is less under the control of the patient.

Digitalis, by far excelling all narcotics in its sedative action on the heart, is only required when there is irritability of that organ, above what is required for carrying on the circulation. As the alternate filling and emptying of the heart must be incessantly kept up, or life is extinct, it is manifestly injurious to debilitate the organ performing these functions when it already labours under peculiar mechanical difficulties imposed on it by disease. Sometimes, however, the heart is rendered morbidly irritable; of which we see instances in pericarditis, in rheumatism of the heart, and in nervous excitements, producing great frequency and force of pulsations. The same occurs in connection with disease of the valves, and the existence of this state is to be inferred from over action of the heart, to be felt by application of the hand, from increased quickness and frequency of the pulse. By these, taken in connection with the peculiar circumstances of the case, the use of the digitalis is to be determined. When it has produced softness of the pulse when hard, or reduced it to the natural standard when over frequent, a continuance of it is useless, and may become dangerous. The diuretic virtues of this medicine are always most apparent when given in pursuance of this rule; and although it possesses an acrid principle, which is capable of irritating the stomach, and which very possibly acts on the kidneys when taken into the circulation, yet its diuretic effect in almost every instance appears to be in

consequence of its allaying the inordinate action of the heart, and consequently facilitating the circulation through the capillaries.[1]

As we cannot afford the heart any cessation from its labours, and as its mechanical function must be performed, even under the greatest disadvantages; when we on the one hand see it expend itself in violent and unnecessary efforts, or on the other see it sinking from want of vigour, we are obliged to act according to the exigency; in the first case to lower its tone by digitalis and other remedies, and in the latter, to administer tonics and excitants. The benefit derivable from preparations of bark, has appeared to me manifest, when the heart has to struggle with mechanical difficulties, and is unable to perform its contractions with its accustomed rhythm. In a great majority of instances, irregularity, or intermission, of the pulse is to be taken as an indication of the heart being in a state of exhaustion; or we may infer this debility already to exist, when increased labour is imposed on it from either adherence or imperfection of the valves. Under these circumstances I give combinations of digitalis and quinine, with the combined effect of tranquillising and invigorating the heart, as evinced by the improvement of the pulse, and restoration of natural heat to the extremities.

The value of blood-letting depends much on the tone of the heart, at the time when it is performed. When there is accumulation in the veins and lungs with the heart in a struggling state, in consequence of over distension, a detraction of blood from the veins causes immediate relief; but in order that this relief may be permanent, or rather, in order that it may not be followed by dangerous sinking, it is requisite that the heart should have sufficient vigour to profit by the removal of the weight. Hence on the day when bleeding is performed, it is usually expedient to prescribe a few stimulant draughts, composed of camphor mixture, with Hoffman's liquor or carbonate of ammonia. The good effect of bleeding in uncomplicated disease of the heart is, however, for the most part only temporary, and the practice of treating disease of the valves by frequent repetitions of it, cannot be too strongly reprobated.

When the urine does not coagulate, or merely throws up a slight froth on being boiled, then the dropsical swellings consequent on disease of the valves, are to be treated with diuretics, and one of the best is the old established compound; of calomel, one grain, squill, two grains, and digitalis, one grain, to be taken thrice in the day. While taking these pills the bowels are usually free twice or oftener daily, and it frequently becomes necessary to give a few grains of Dover's powder at night, to check the tendency to

[1] The great advantage which I have obtained from it in the treatment of amenorrhœa is a confirmation of the correctness of this explanation of its mode of action. In cases of menstrual obstruction with excessive action of the heart and yet cold extremities, I often, along with the hip bath, &c. use the following formula, at the time when that discharge is to be expected: R. Tinct. digit. dr. j. sp. amm. aromat. dr. iij. infus. secal. cornut. oz. viiss. *m.* St. oz. j. tertiis horis.

diarrhœa. The continuance of the digitalis must be regulated strictly according to the action of the heart as before mentioned; and if the bowels are too sensitive to bear the squill or calomel, they may be for a time superseded by mercurial pill, and extract of taraxacum. Diuretic drinks should likewise be taken, for example, solution of supertartrate of potash; mead or cider diluted with water.

When it is desirable to procure exhilaration with the least stimulation, either spruce beer or ginger beer may be taken.

Much of the success to be hoped from treatment will depend on the adjustment of diet to the circumstances of the case. Some of the French authors have recommended almost total abstinence, the *diæta aquea* of the ancients. If life could be maintained for some time without the action of the heart, it is evident that great advantage would result from giving complete repose to the organ; but as this is impossible, and as we find that when some of the cavities of the heart are preternaturally distended, they resemble the bladder in the same state, and require a greater degree of vigour than ordinary, to enable them to propel their contents, it follows that abstinence must not be carried on so far as to induce languor of the pulse, or coldness of the extremities.

In sudden states of depression, when the heart is over distended, and unable to propel its contents, and the patient appears at the point of death, I cannot too strongly insist on the benefit to be derived from the use of the more powerful stimulants. By a free access of fresh air to the patient's face, the rest of the body being kept warm, and the use of Geneva and water in spoonfuls frequently repeated, the heart, even in the most desperate forms of valvular disease, may be enabled to continue its labours, and thus may time be gained for the employment of more permanently effectual remedies.

CASES TO ILLUSTRATE DROPSY FROM VALVULAR DISEASE OF THE HEART.

(In the following, the details of treatment are abridged, unless where necessary to explain the symptoms.)

CASE VII.—*Contraction of mitral opening—effusion into the right pleura—general œdema—death.*

Margaret Fagan, aged thirty, married: the last child ten years ago. Admitted 16th March 1829. Œdema of face and legs; abdomen swelled and fluctuating; conjunctiva distended and watery; cough with bloody expectoration; is generally unable to lie down; lying on the left side in particular produces a sense of suffocation. No pulse can be felt at the wrists, it is perceptible at the axilla, natural in frequency, but very feeble; extremities cold and livid; lividity of lips: tenderness at left epigastrium; dull sound on percussion at lower part of right side; slight crepitation and bronchial

sounds at right scapula; crepitus at base of left lung; dry bronchial sounds in superior part of same; has been subject to palpitations the last five years; present attack has lasted five weeks. 18th. Expectoration viscid and sanguineous; diarrhœa; fæces mixed with bloody mucus; left cheek more suffused than right; lies now on her back toward the right side. 20th. Continues sensible, and replies to questions; pulse imperceptible at the axilla, and scarcely to be felt in the subclavian; since her admission, the action of the heart cannot be felt; lips rather less livid; other symptoms as before. 21st. Died this morning.

Necroscopia.—Thorax: right cavity nearly filled with transparent straw-coloured serum; lung compressed towards the root, and upwards under the clavicle; lower lobe nearly severed from the rest, and adherent to the diaphragm; several bands of lymph, intersecting each other, held the lung in this position; substance of the lung nearly hepatised in two or three parts; the remainder in less advanced stages of inflammation; left cavity, lung emphysematous at inferior angles and anteriorly, some inflammation commencing in the upper part of the lower lobe; bronchial tubes highly vascular; pericardium containing scarcely half an ounce of fluid. Heart: auricular portion much enlarged; left auricular ventricular opening closed, so as barely to afford passage for a goose-quill; left auricle hypertrophied, and in it an ovate mass formed of concentric layers of fibrine (as in aneurisms) about the size of a walnut, and attached by a pedicle; the interior of this was opened, and found to contain a grayish white fluid. Abdomen: some fluid in the cavity of the peritonæum. In the uterus, three small vascular tumours.

CASE VIII.—*Contraction of mitral opening—ascites—œdema—pulmonary apoplexy—pneumonia—death.*

Sophia M'Keon, aged 23, married; last child a year ago; admitted 9th of April, 1831; cough; dyspnœa—the latter greatly increased by lying on her back; severe pain in the left side; expectoration bloody; respiration almost inaudible, with dull percussion at the base of the left lung posteriorly; bronchial sounds in various portions of both lungs; abdomen swelled and fluctuating; œdema of legs; pulse 84; extremities cold; reports her cough to have lasted four years; has suffered from dyspnœa during the last four months, for which she was under medical treatment in Manchester: she was now directed to be bled, and to get pills of calomel and squill, and a mixture of decoction of seneka with Hoffman's liquor. 10th. Expectoration bloody; *bruit de souffle*t in the long sound of the heart: when the operation of bleeding was performed, the blood was at first projected from the vein, as if from an artery; a blister, and to continue the remedies. On the 16th she was bled, and on the following day the cough and dyspnœa were much improved; the expectoration was less sanguineous; crepitation heard in inferior part of right lung poste-

riorly; ptyalism; infusion of juniper, with tartrate of potash. 19th. Pulse 108, scarcely perceptible; yesterday had a slight pain in the left breast, which is now enormously swelled and fluctuating, with appearance of ecchymosis; œdema of face increased; respiration easy; debility much increased; awoke with screams several times during the night; draughts of camphor mixture, Hoffman's liquor, and carbonate of ammonia, every second hour; six ounces of wine. 20th. Died this morning.

Necroscopia.—Thorax: aortic valves thickened, and presenting semicircular edges; mitral valves ossified, and adherent to each other; leaving an opening between the auricle and ventricle, less than the size of a sixpence, which could not be closed; left auricle greatly hypertrophied and dilated; both ventricles, as well as the left auricle, dilated; above a pint of brown serum in the pericardium; a small quantity of fluid in both pleural cavities; two large coagula of blood in the substance of the right lung towards its base, some smaller ones in the left.

CASE IX.—*Symptoms as in the two previous cases, with œdema and coagulable urine—relieved.*

William Behan, aged 20, shop porter. June 8th, 1836. Cough, especially at night, with frothy and salt expectoration; dyspnœa, soreness at the pit of the stomach, with a sense of tightness and weight; decubitus easiest in the prone posture. He cannot lie on his back, and generally sits up; dull sound on percussion beyond the præcordial limits; a loud *bruit de soufflet*, respiration over chest very feeble with a trace of crepitus, most distinct in the left side posteriorly; has had hæmoptysis; distress greatly aggravated by exercise; sleep disturbed by starts; urine frothing thickly when heated; appetite moderate; pulse 96. About eighteen months ago, his complaint commenced; he obtained relief in hospital, but a renewal of the symptoms came on about three weeks ago; he has been much exposed to cold, and is addicted to drink. Mittant. sang. oz. xij. elect. jalap. ad effect. haust. eff. c. mist. camph. 10th. Hirud. viij. reg. cord.; cal. gr. iv. o. n.; rept. elect. 11th. Œdema declining; dyspnœa less; pulse 96; balsam copaib. gr. xxx. o. n. vesicat. reg. cordis. 16th. Swellings nearly gone; sleeps well; about two dejections daily; R. ext. tarax. gr. iv.; digital. gr. i.; carb. ammon. gr. i. *m*; ft. pil. ter in die sumend. 24th. Dismissed free from complaint.

Dropsy from Disease of the Lungs.—Those diseases which most interfere with the passage of the blood through the lungs, are pneumonia in its advanced stages, and emphysema. In pneumonia, the disease has hitherto been so generally treated by bleeding at the commencement, that the opportunities of seeing its advanced stages have been comparatively rare; but since what has been termed the tartar emetic treatment has been introduced into this country, and the practice of bleeding has consequently been

to some degree discouraged, it appears to me that the advanced stages and fatal terminations of pneumonia have been more frequent; and in this judgment I am confirmed by records on the large scale. Œdema following pneumonia is usually gradual in its approaches, being at first confined to the ankles. When unaccompanied by coagulable urine, pills of calomel and squills, repeated till the mouth is slightly affected, and occasionally superseded by draughts of a dram of acetate of potass dissolved in an ounce of infusion of juniper, with the addition of compound spirit of juniper one dram, and sweet spirit of nitre ten drops, to be taken thrice in the day; for hepatisation of the lungs, friction over the hepatised portion, with equal parts of mercurial, iodine, and cantharides ointments; and for emphysema, in addition to the treatment above recommended, frictions with equal parts of tincture of capsicum and compound camphor liniment to the emphysematous regions, are suitable adjuvants; and in both those diseases, much depends on keeping the skin in a perspiring state by confinement to the bed, and by the administration of diaphoretics at night. It often happens, under this treatment, that the œdema is removed, although the disease of the lungs may prove refractory, and even proceed towards a fatal termination; and such cases afford a good illustration of the impropriety of directing exclusive attention to dropsy, which is only a symptom, to the neglect of the disease which produces it. Emphysematous portions of the lungs often become œdematous when the general dropsy cannot be successfully combated; and this may be known, not only by a dull sound on percussion succeeding the clear sound of emphysema, but also by a diminution of that peculiar respiration of emphysema which consists in the expirations being much longer than the inspirations; a peculiarity which I am surprised at not having seen described, as its importance merits, in works written professedly on the subject.

Case X.—*General œdema—pneumonia—recovery.*

Catharine Walsh, aged 60, married. 8th March. Swellings of face and exterior of body; pulse 70; cough, with copious semi-viscid and semi-transparent expectoration. Bronchitic sounds throughout both lungs; moist crepitus towards the base of the left; sleeps much more than usual, and complains of a noise in her head resembling the tide, accompanied with stupor. Duration of illness twelve weeks. Has been taking pills of calomel and digitalis, with electuary of jalap, during the last five days. Mitt. ex arteriâ temp. sang. oz. xij. R. Cal. digit. utriusque granum scillæ grana ij. *m.* ft. pil. tertiis horis sumenda. 9th. Noise in the head diminished; crepitus in left mammary region; cont. pil. 15th. Severe cough; pulse 96, strong, full; swellings gone. Mitt. sang. oz. xiv. cont. pil. 16th. Sanguineous expectoration this morning; blood not buffed. After this day, the improvement was steady and rapid, and she was dismissed free from complaint.

Case XI.—*General œdema—bronchitis—emphysema. The two former removed, and the last evidently reduced under treatment.*

John Kergan, aged 12. February 28th. Severe cough; urgent dyspnœa; expirations twice as long as inspirations; palpitations excited by any exercise, however slight; pulse 128, weak; lips livid; face and extremities slightly œdematous; bronchitic sounds throughout the chest; emphysematous crepitus at the lower half of the left lung, with unnaturally clear sound on percussion; decubitus easiest on the left side, or leaning forwards. Duration of present symptoms nearly three months. Hirud. vj. laryngi; vesicat. sterno; pil. ipecac. et sod. ter in die. March 4th. Cough much better; pulse 80; ordered an expectorant mixture, and the following liniment to be rubbed over the emphysematous portions of the lung three times daily. R. Liniment sapon. oz. ij., mist. camph. oz. i., olei terebinth. tinct. iodinii utriusque, oz. ss. *m.* 9th. Cough much less; lividity of lips and œdema gone; ordered a mixture of gum ammoniac; liniment to be continued. 13th. Emphysematous crepitus now heard only at the lower edge of the lungs, and the respiratory murmur is restored nearly throughout the lung; length of expirations to inspirations as three to two. Dismissed in a few days free from complaint.

This case is remarkable, from the removal of all the symptoms of emphysema under the use of the above mentioned liniment, which was rubbed in with exemplary diligence by a patient who happened to be in the same ward during his illness.

Debility is the cause of those dropsies which supervene in far advanced stages of several chronic diseases; as phthisis, chronic dysentery, cancer, &c.; and they appear in such cases to be produced by imperfect transmission of the blood through the heart and lungs. Dropsy of this kind, considered independently of the disease producing it, may be treated by the chalybeates much diluted, as in some of the mineral waters, or by alternate changes of various diuretics to be described under the head of ascites. The slight form of this kind of dropsy, which consists in swelling of the ankles coming on every evening, often yields to twenty drops of sweet spirit of nitre taken thrice daily, with occasional purgatives, as the following:—R. Supertart. potass. dr. i., cambog. gr. i., camphor. gr. i., in tinct. zinzib. gutt. viij., solut. mannæ oz. ss., aquæ oz. i. *m.* ft. haustus. Where there is loss of appetite, it may frequently be revived by tar water, an ale-glass full taken thrice daily; which also produces a great increase of urine, with increased heat in the extremities, but loses its efficacy generally at the end of a fortnight. It may, however, be repeatedly resumed at intervals with similar advantage.

PART IV.

ON DROPSIES DEPENDING ON TOPICAL AFFECTIONS.

1. *Ascites.*—When arising from diseased liver, it is usually sufficiently known from the history of the case, which shows the general tumefaction of the abdomen to have been preceded by pain, enlargement, induration, in the region of the liver, jaundice, ague, or some other affection, pointing out it as the original seat of disease. When the disease is most confined to the peritoneal surface, then a successful termination may be expected; but when the substance of the organ is indurated or tuberculated, then the cure is not only difficult, but in many cases impossible. The two first of the following cases are illustrative of ascites produced by inflammation of the peritoneal surface of the liver.

Case XII.

Mary Reilly, aged 32. Admitted to hospital Jan. 15. Abdomen tumid and fluctuating; œdema of face and legs; pain in the right hypochondrium shooting to the spine, increased by pressure; skin yellow; headache; alvus tarda; no sleep; appetite remains; tongue clean; pulse 76, weak; cough, with nausea and diarrhœa, commenced five weeks ago. Complaint attributed to cold. Has been taking pills of blue pill, squill, and calomel. R. Pil. hyd. gr. iij., ipecac. gr. i. ter in die; admoveantur hirud. xij. regioni jecinoris; cream of tartar whey. 16th. Pain on pressure gone; yellowness diminished; pulse 72. R. Unguent. iodinii, ung. hyd. muriat. ammon. sing. dr. ij. *m.* divide in chartulas viij. Infricetur una regioni jecinoris mane nocteque. 18th. Abdomen much less; general œdema nearly gone; pills and ointment to be continued; haust. terebinth. 21st. Has got a slight cold. Omitt. remedia; haust. efferv. 23d. Bowels lax; pulse 72; swellings gone. Dismissed free from complaint.

In the following, the same combination of ascites and hepatitis existed, and was removed under the treatment; but the head continued to labour under pain, which was not removed till after repeated applications of leeches to the Schneiderian membrane. This operation is best performed by passing silk through the tail end of the leech by a needle; and the operator can afterwards hold the thread, so as to restrain the leech from ascending too high.

Case XIII.

Ellen May, aged 25. Admitted October 19. Abdomen tumid, with fluctuation; œdema of feet; pain in right hypochondrium, increased by lying on the opposite side; pain in head and neck, the former increased by coughing; bowels confined; catamenia regular. Haust. terebinth. statim; hirud. viij. temporib. haust.

efferv. 20th. Head better; œdema less. R. Infus. juniperi. oz. viiss., sp. jun. comp. oz. ss., tart. potass. oz. i. *m.* sum. unciam tertiis horis; semicupium vesp. 24th. Œdema of legs gone; swelling of abdomen diminished; has taken electuary of jalap twice since last report, and with effect; pain of head, with dimness of vision. Hirud. ij. naribus. R. Tinct. seminum colchici. spirit junip. comp. utriusque oz. ss., infus. junip. oz. vj., tart. potass. dr. j., aquæ cinamom oz. j. *m.* sum. oz. j. tertiis horis. 25th. Head better; cont. mist. 27th. Camphorated senna mixture. 28th. Complains of frontal headache, with irritation of the conjunctiva, as from sand; pain in right shoulder; a slight tension of the abdomen. Hirud. ij. naribus. R. Assafœtidæ. extr. aloes aquos. mass. pil. hyd. carb. ammon. singul. granum. ft. pilula; secundis horis sumenda. 29th. Head well; eyes better; deject. 2. cont. pil. semicup. vesp. 31st. Bowels confined; tongue loaded; pain in the head on moving. Mist. sennæ. camph. secundis horis ad effectum. 1st. Nov. Rept. hirud. ij. naribus. semicup. emplast. ammon. cum hydrarg. lateri dextro. 2d. Head nearly free from pain. R. Sp. am. fœtid.; sp. ammon. aromat. utriusque oz. ss. *m.* sum. guttas. xxx. ter in die. 5th. Dismissed free from complaint.

The following six cases were connected with disease of the substance of the liver.

William Cuissett. Admitted Nov. 1828. Addicted to spirituous liquors; abdomen tumid and fluctuating, with occasional pain in the right hypochondrium. Before admission, had been tapped, and had been under treatment. After admission, he had two severe attacks of erysipelas, in the last of which he became comatose for two days. During the last fortnight, delirium occasionally came on. The day before his death he was free from pain, and considered himself to be recovering; but on that night he was seized with a sudden and profuse vomiting of blood, and died early next morning.

Necroscopia.—Several quarts of serum in the peritoneal cavity; liver filled with spherical tubercles; a transparent globule (*quære* hydatid) of the same size and shape being among them; mucous membrane of stomach universally vascular; large quantities of blood and bloody mucus, resembling red currant jelly, in the stomach, and throughout the intestinal tube, extending to the rectum, towards which the colour became darker; mucous surface of intestines healthy; peritoneal slightly opaque; no trace of inflammation at the place where tapping was performed. Head: increased quantity of water under the arachnoid, and in the ventricles.

Case XIV.—*Ascites with tuberculated liver—Effect of solution of corrosive muriate of mercury rubbed on the abdomen—Death apparently caused by opium.*

Sarah M'Donough, aged 46, married, without children. Admitted May 9, 1835. Abdomen swelled, with fluctuation; urine froths by

heat; sometimes perspires; pulse 72, pungent; bowels free; dejections whitish. Complaint commenced with pain at scrobiculus cordis, and has lasted between three and four years. Was tapped three months ago. Hirud. x. reg. hepat. R. Muriat. hydrarg. corrosiv. grana iv. alcoholis oz. j. *m.* Infricetur oz. ss. abdomini ter in die. 17th. A slight erythema has been excited over the abdomen; a purging, with tenesmus, during the last four days. Omitt. frictio. R. Mist. cretæ oz. vj. ext. opii gr. ij. *m.* sum. oz. j. post dejectionem q. q.; decoction of log wood for drink. 19th. Diarrhœa has ceased. Repet. frictio. et mist. 20th. Diarrhœa returns. Cont. 25th. Vomiting and purging; tongue dry and white; pulse 120; abdomen rather softer; soreness of gums, with slight ptyalism. Haust. efferv. cum aceti opii gutt. ij. omni hora ad levamen. Enema amyli cum tinct. opii gutt. xxx. statim. Hot salt to be applied to the abdomen. 26th. Diarrhœa continued last night; pulse 104; begs that she may be tapped. R. Ext. opii aquos grana ij. sp. æther. nitros. dr. ij. aquæ lauro-cerasi dr. vj. mist. amygdal. oz. vij. *m.* sum. oz. j. omni hora et semissa; admov. hirud. iij. recto; sinapismi abdomini. 27th. Diarrhœa has ceased, without taking the mixture; leeches bled well; urine increased; sinapism. abdom. cont. mixt. 28th. Alvus tarda; pulse 84. R. Crys. tart. dr. ij. rhei gr. xiv. mist. camph. oz. iss. *m.* ft. haust. stat. sumend. A pint of spruce beer. 29th. Dej. 3. hirud. xij. abdomini; sinapisma imo abdomini. R. Calomel gr. j. ext. tarax. gr. vj. *m.* ft. pil. ij. ter in die sumendæ. 30th. Abdomen softer. Rep. hirud. cont. cæt. June 1st. Pulse 108; abdomen appears to diminish; uneasiness in the bowels. R. Sp. fœnicul. dulc. gutt. xij., sp. æth. nit. dr. j., mist. cretæ. oz. vss., syr. aurant. dr. iij., m. sum. oz. j., post pil. 4th. Complained of strangury, for which the usual remedies were ordered. The next day relief was obtained. The swelling of the abdomen continued progressively to decrease, when, after a few days, death suddenly took place in the night, and it was discovered that she had taken an unknown quantity of laudanum, a bottle of it nearly emptied having been found under her pillow.

Necroscopia.—Fluid in the peritoneum; liver tuberculated; kidneys slightly interspersed with granular structure; one ovary distended with fluid to the size of a large cocoa nut; the sac strong and thick.

Before I relate some cases of ascites successfully treated, I beg to claim the reader's attention to what has been stated with respect to this form of disease in combination with coagulable urine (See page 64). The same observations apply to ascites with coagulable urine. As the collection of fluid in the peritoneum is not a fatal occurrence, the patient should be allowed to live with it, if it appears, after a fair trial of remedies, that we are unable to remove it. Hence I am constrained to protest against the practice so commonly followed, of attacking every case of ascites with reiterated courses of mercury, and other remedies equally heroic, until either absorption of the fluid or death shall ensue. By stopping active

remedies for a time, by not continuing the use of any one diuretic as soon as it has ceased to produce an increased secretion, or has been ascertained to be inefficient, and, above all, by making frequent changes of them, I find the ascites gradually to disappear; while at the same time the general health is completely restored, and this even when the case is undoubtedly connected with deep-seated disease of the liver. It is remarkable, that, in Cœlius Aurelianus, this mode of proceeding is to be found applied to the treatment of several chronic diseases; his object being to change the mode of action on which disease depends, as we learn from the courses or cycles of remedies, which he describes under the name *recorporative* (Chron. lib. I. c. i.), or alterative and *resumptive*, or tonic. For examples: in cephalæa he commences with a *resumptive cycle*. On the first day, the patient is either to abstain entirely from food, or to use the smallest quantity. On the second, he is to take exercise, to be anointed, and to take a little either of vegetables, fish, or small birds. This to continue two days. Then he adds to the amount of food; after three days, he permits hares and kid. By degrees increasing the allowance of wine, he comes to the termination of this cycle; afterwards the recorporative succeeds. On the first day, abstinence; on the second, the bath, carriage exercise, inunction; one third of the patient's ordinary allowance of bread, acidulous wine, mustard, olives, capers, salted gruel. From the third day he adds to the quantity of food and drink; and afterwards proceeds from fish to birds, and from them to the flesh of wild animals, joining to these external applications of various kinds. At the termination of this cycle, he gave emetics of mustard, or of vinegar of squill, and aided the vomiting by warm water. In like manner the patient resumed the same course anew. What was done by Cœlius in the article of diet, I have endeavoured to accomplish also in respect to medicines. In the diseases of the liver, connected with ascites, having frequently observed amendment to follow the occurrence of copious spontaneous hemorrhage from the bowels, I determined, in some cases, to carry into effect the mode of producing this hemorrhage, which I described in the third volume of the Dublin Journal. Two or three leeches are transfixed with a needle, and attached by strong silk. The silk threads having been placed in the grooves of the instrument, the leeches are introduced along with it into the rectum above the sphincters. They usually remain about a quarter of an hour, and at the end of that time may be pulled out by the extremities of the silk, which remain outside. The hemorrhage subsequent to their application, has not in any instance lasted so long as to render it necessary to adopt any measures to stop it; but in case of such an occurrence, an enema of solution of nitrate of silver would probably be sufficient.

External applications are of the greatest importance in this disease. Mr. Hunter said that an inflamed surface was a bad absorbing one. The contrary appears to be the fact; when mercurial ointment is applied to the skin in erysipelas, it produces ptyalism

with singular rapidity; and wherever blisters have been applied, there the ecchymosis of leech-bites disappears much sooner than in other parts of the skin, thus showing increased activity of the absorbents. Hence, in order to promote the general effect of mercurial or iodine ointments on the surface of the abdomen, it is well to add some cantharides or camphor, or to apply a sinapism to the skin previously to their use. As soon as mercury has produced soreness of the mouth, it should be suspended, as a severe salivation is usually found to interrupt the secretion from the kidneys; but its moderate action may be kept up by small doses of blue pill, frequently repeated for some time, during which counter-irritants over the abdomen are to be assiduously applied, except when replaced by fomentations, which have been known in the hands of ignorant persons to have sometimes accomplished a cure,[1] even when unassisted by other means.

In the treatment of ascites more than any other form of dropsy, the repeated use of purgatives is required. These should be varied according as they act on different portions of the intestinal tube. I here subjoin some of the most suitable formulæ, with the number of dejections which they produce, as averaged from a great number of observations:—

	Average number of motions.	Hours before com. of operation.	Observations.
PIL. CROTON. COMP. R. Ext. Al. aquos. dr. i., Rhei. scr. ii., Olei Croton. gutt. vj. *m.*, Ft. pil. xxiv.—Dose 2.	4	3	Full motions in all; nausea in $\frac{1}{3}$.
PIL. ELATERII COMP. R. Elaterii grana iv., Scammonii scr. i., Ext. Al. aquos. scr. ij., Ext. Hyos. scr. iss. *m.*, Ft. pil. xxiv.—Dose 2.	3	2	Nausea or vomiting in all.
SOLUTIO CAMBOG. ALKAL. R. Cambogiæ dr. ss. solve in aq. potass. caust. oz. ss. Dose, thirty drops in a wine glassful of water.	3	1	Full motions requiring repetition in $\frac{1}{2}$; total failure in $\frac{1}{6}$; nausea and tormina in $\frac{1}{3}$.
HAUSTUS CAMBOGLÆ. R. Supertart. potass. dr. ij., Cambog. gr. i., Mannæ oz. ss., Camphoræ gr. i. in Tinct. Zinzib. dr. i. solut. Aquæ oz. i. *m.*	2	3	Nausea or tormina in almost all; failure in $\frac{1}{2}$.
MISTURA SENNÆ CAMPH. R. Infus. Sennæ comp. oz. vij., Sulp. magnes. oz. j., Tinct. jalap. dr. vj., Tere cum camphoræ, gr. viij. *m.* Dose, oz. i.	5	$2\frac{1}{2}$	Nausea in $\frac{1}{4}$; repeated doses required in $\frac{1}{3}$; total failure in $\frac{1}{7}$.
HAUSTUS OLEOSUS. R. Olei. Ricini. oz. ss., Tinct. Sennæ comp. dr. ij., Aq. menth. pip. dr. vj. *m.*	3	$1\frac{1}{2}$	Nausea in $\frac{2}{3}$; failure in $\frac{1}{10}$.
HAUSTUS TEREBINTH. R. Additur priori Olei. Terib. dr. iij. et omitt. Tinct. Sennæ.	4	2	Nausea or vomiting in $\frac{1}{3}$; motions full, rarely griping; failure in $\frac{1}{14}$.
PULV. JALAPÆ COMP. Dose, dr. i.	2	3	Tormina in $\frac{1}{4}$; repeated doses required in $\frac{1}{3}$.

[1] I have in my possession a MS. account of the cases of two gentlemen, well known in the King's County, where they resided; one far advanced in

Case XV.

Robert Vaughan, aged 19. Admitted November 9th, 1835. Abdomen greatly swelled and fluctuating; œdema of legs; emaciation; pulse 96. Loss of voice; cough; skin dry; duration of complaint nine weeks. Has indulged largely in the use of ardent spirits. Pulv. jalap. comp. dr. i. statim. 5th. Bal. tep. vesp. R. Pulv. Jacob. ver. gr. viij. calomel gr. iv *m.* h. s. sumendus. Haust. terebinth. c. m. 6th. Œdema of legs diminished. Epistaxis yesterday. R. Ung. hydrarg. dr. ij., ung. canthar. dr. i., ung. iodinii; dr. iij. mur. ammon. oz. ss. *m.* Divide in chartulas viij. Infricetur una regioni jecinoris mane nocteque. Rep. pulv. h. s. semicupium. vesp. 10th. Abdomen decreasing in size; enlarged and indurated liver can now be distinctly felt. Rep. pulv. haust. tereb. c. m. cont. unguent. 11th. Epistaxis has again occurred; urine and drink reported to be equal, being three pints each. Pulv. jal. comp. dr. i. c. m. hirud. xij. jecin. cont. ung. 17th. Hirud. iij. recto. 18th. Bleeding from the rectum continued about four hours; pulv. jal. c. dr. i. cont. unguent. 19th. Rep. hirud. recto. 24th. Gamboge draught; cont. ung. 29th. Abdomen diminishing. Rep. hirud. recto; cont. ung. Dec. 3d. Rep. haust. cambog. 6th. Rep. hirud. recto; infric. ol. croton. gutt. x. c. m. 7th. Croton oil produced a bright erythema on the skin, about six hours after its first application. 15th. Abdomen steadily diminishing; hirud. iij. recto; calomel gr. iij. h. s. haust. cambogiæ c. m. 17th. Rep. hirud. R. Calomel gr. i. ext. tarax. gr. iv. *m.* ft. pil. ter die sumend. 22d. Cont. pil. rep. hirud. 26th. Abdomen continues to diminish; pulv. jal. comp. dr. i. cont. pil. 30th. Haust. terebinth. 31st. Pulv. jal. comp. Jan. 2. Ptyalism; rep. hirud. In a few days, the abdomen being reduced to the natural standard, and the size of the liver much diminished, he was dismissed free from complaint.

Case XVI.

Mary Hyland, aged 69, a widow. Admitted 9th of September, 1830. Abdomen swelled and fluctuating. A hard tumour is distinctly felt in the hepatic region; pain of right shoulder; pulse 84. Œdema of left leg occasionally; urine scanty, not coagulating by heat; some perspiration; duration of swelling of abdomen one month. Had pain in the right side three months ago, for which she took various remedies with the effect of relieving the pain.

life, who, after the treatment of the faculty had proved ineffectual, were both cured, under the care of an old woman, by the following application:— a quart of snails pounded, two handfuls of bog liverwort, the latter boiled and thickened with barley meal, and then mixed up with the former; to be applied over the navel every night, and secured with a tight bandage. After this poultice was taken off, a tight bandage was constantly worn for some time.

Elect. jalap. ad effect. 10th. Hirud. iv. recto; solution of supertart. of potass for drink; R. infus. junip. oz. vj., aceti. scill. dr. ij., tart. potass oz. ss., aquæ cinnam. oz. iss., syr. simp. oz. ss. *m.*; sum. oz. i. tertiis horis. semicup. vesp. 12th. Abdomen softer; cal. gr. iij. omni nocte; cont. cætera. 14th. R. Elaterii granum. conserv. ros. q. v. *m.* ft. pil. iv. sum. unam quartis horis ad effectum. 15th. Eight dejections after two pills. R. Scill. gr. iij. cal. gr. i. ft. pil. ter in die sumend. 16th. Haust. tereb. cont. pill. 18th. Vesicat. ij. parva abdomini; rep. haust. tereb. cont. pill. 20th. Abdomen less; rep. haust. tereb. cont. pill. 23d. R. Infus. juniper. oz. vj., tart. potass. dr. i., sp. nitri dulcis dr. ij. st. oz. i. omni mane; cont. pill. 27th. Urine increased; abdomen diminished. Haust. tereb. cont. cætera. Oct. 5th. Ptyalism; abdomen much reduced, nearly natural. Some tumefaction of liver still perceptible. Omitt. pil. cont. mist. infric. liniment. volat. abdomini quotidie. After a few days of steadily progressive improvement she was dismissed.

Case XVII.

Margaret Reilly, aged 32. Admitted to Mercers' Hospital 15th of January, 1835. Abdomen swollen and fluctuating. Pain in the right hypochondrium increased on pressure, and shooting to the spine; œdema of face; jaundice; urine unaffected by heat; pain of head; bowels confined; appetite good; tongue natural; pulse 76, weak. The abdomen began to swell about five weeks ago, at which time she was attacked with nausea and diarrhœa; she attributes it to cold; has been taking blue pill, squill, and calomel. R. Mass. pil. hyd. gr. iij. ipecac. gr. i. ft. pil. ter in die sumend.; admov. hirud. xij. regioni jecinoris; cream of tartar whey for drink. 16th. Tenderness on pressure removed; pulse 72. Yellowness diminished; R. unguent; iodinii. ung. hydrarg. muriat. ammon. singul. dr. ij. *m.*; divide in chart. viij. Infric. una mane nocteque; cont. pil. 18th. General œdema nearly gone; abdomen much less. 19th. Haust. tereb. cont. cætera. 21st. Has got a cold, with the usual febrile symptoms. R. Carb. ammon. dr. i., succi, limon. q. s. ad. saturand. adde aq. menth. pip. oz. iij., syr. aurant. oz. i., sp. ammon. aromat. dr. ij. *m.*; sum. coch. iij. ampl. secundis horis; omitt. cætera. 23d. Febrile symptoms have ceased; swellings completely removed. Dismissed free from complaint.

Case XVIII.

William Parnel, aged forty, proprietor of an eating house; of most intemperate habits. Admitted to Mercers' Hospital, 14th of May, 1836. Abdomen tumid, fluctuating; œdema of legs; jaundice; feels a sensation of a weight falling from the right hypochondrium, which prevents him from lying on the left side. Urine loaded as in jaundice; dejections clay-coloured; fulness in right hypochondrium, and dull percussion extending nearly half way up the right side of thorax; pulse 116. Anorexia; thirst; tongue

dry in the middle; great debility. Illness is reported to have commenced about three months ago, with hemorrhage from the nose, on which occasion he is stated to have lost about five quarts of blood. Cucurbit. regioni. jecinoris et mittant. sang. oz. x. mist. sennæ camph. ad effect. limonade. 16th. Rep. cucurbit. et mitt. sang. oz. xij. Sum. meridie et vesperi pulv. ex calomel. grana ij. pulv. Jacobi veri gr. vj. *m.* 17th. Hirud. x. regioni jecin. cont. pulv. haust. efferv. secundis horis. 19th. Blood passed with the last three dejections, not mixed, and unaccompanied by pain; pulse 96, pungent. Tumefaction of abdomen diminishing. 20th. Hemorrhage from the bowels continues. R. ung. hydrarg. dr. j. muriat. ammon. gr. viij. camphoræ gr. ij. *m.* Infricetur abdomini mane nocteque; cont. pulv. et haust. efferv. 23d. Some blood with each dejection; jaundice diminishing; omitt. pulv. cont. cætera. 26th. Urine of a deep madeira colour without sediment, not coagulating, (as at first,) but frothing to heat; three dejections daily, of a better colour; pulse 96. Abdomen to be sponged with the nitro-muriatic solution twice in the day; cont. unguent.; a pill of elaterium; a bottle of spruce beer daily; omitt. cætera. 30th. A great operation from the pill; mouth sore; ptyalism. Had a perspiration the night before the last. Mist. quininæ oz. ss. ter in die pulv. Doveri gr. viij. h. s. (These were ordered to hold in check the ptyalism which appeared likely to become excessive). Decoct. catechu pro gargarismate. June 2d. No swelling now except in the abdomen, which is much diminished. R. Liniment. camph. comp. tinct. capsici utriusque oz. ij. liquor muriat. calcis, tinct. digital. utriusque oz. ss. *m.* Infricetur abdomini oz. ss. ter in die. R. Infusi pyrolæ umbellatæ oz. viij. infus. tarax. oz. iij. acetat. potass. oz. j. *m.* sum. oz. jss. ter in die. 8th. Swelling of abdomen steadily diminishing; mouth very sore. Haust. terebinth. garg. boracis; cont. cætera. 13th. Improving in every respect; abdomen nearly natural: pulse 90; urine increased; mouth still sore. Elect. sulphur. coch. min. mane et meridie. The medicines of the 2d June were resumed for a few days, and he was dismissed on the 23d free from complaint.

Case XIX.

Thomas Connor, aged forty-two, afforded a remarkable proof of the advantage of hemorrhage from the portal system. He was admitted into hospital the 26th of April, with ascites and general œdema. The enlarged liver could be felt extending over the greater part of the abdomen. The urine coagulated by heat. The treatment consisted chiefly in the application of leeches and cupping over the region of the liver; thirty drops of balsam of copaiba thrice daily; rubefacient frictions, with frequently repeated elaterium pills. Although the swelling of the abdomen declined, and the coagulation of the urine was less, still the progress towards recovery was very slow till the 2d of June, when a vomiting of blood to a large amount took place. After this the diminution of the liver

and of the fluid in the abdomen went on rapidly without any change of treatment, and he was soon discharged free from complaint.

A singular case occurred to me, which showed that the pain at the tip of the right shoulder, which is so common an attendant on affections of the liver, belongs to irritations at its posterior and diaphragmatic portions rather than to those of its anterior. A young woman had repeated abscesses of the liver. When they proceeded inwards (as known by their bursting into the stomach), then for some time previously there was the pain at the shoulder; but this did not come on when they protruded outwards. She experienced the same combination of symptoms at several repetitions of her disease.

Ascites produced by peritonitis, independently of disease of the liver, is usually easy of cure if not of long duration. In the following case it was combined with pleuritic effusions; and it will be perceived that these also yielded to the ordinary treatment.

Case XX.

Patrick Connolly, aged fifty, a porter (deprived of one of his legs), admitted 27th of October, 1831. Abdomen swollen and fluctuating; pain in left hypochondrium preventing him from lying, except on his right side or back; some cough and dyspnœa on lying down, especially on the left side; left foot œdematous; urine much diminished, uncoagulable; pulse 80; during the last five weeks he is stated to have passed only about two wine-glassfuls of a deep colour twice daily; puerile respiration under left clavicle; respiration quite inaudible, and percussion dull in the lower half of thorax at both sides; duration of illness three months. Commenced with pain in abdomen in left hypochondriac region. R. Infus. junip. oz. vi. sp. junip. comp. oz. ss. aq. menth. oz. iss. tart. potass. oz. j. sum. oz. j. ter in die; pil. cal. et scill. ter in die. 29th. Three dejections daily; foot less swelled; urine much increased. 31st. Mittant. sang. oz. xij. cont. pil. et mist. Nov. 1. Blood not buffed; dyspnœa relieved; perstet. 3d. Ptyalism; left decubitus easier; swelling of abdomen rather diminishing; tormina; mist. mag. ter in die; omitt. cætera. 8th. Dyspnœa greatly abated; dull percussion as before; abdomen not much less than at first; rept. pil. cal. et scill. nocte; mist. junip. mane et meridie. 16th. Alvus tarda. R. Tart. potass. tinct. jalap: utriusque dr. ij. aq. menth. oz. j. *m.* ft. haust. statim sumendus. 17th. No effect from draught; haust. terebinth. 18th. Bowels freed; cont. pil. et mist. 27th. Lies in every direction without inconvenience; some portions of thorax at first dull on percussion, now clear; abdomen greatly reduced, nearly natural; pulse 76; cont. pil. et mist. In a few days he was dismissed free from swellings, and in the enjoyment of his usual health.

Hydrothorax is rather an unfrequent occurrence at the early periods of general dropsy produced by the causes already

enumerated. In those cases it is most usual towards the approach of death, or at least when the forces of the circulation are very much sunk. In several general dropsies, in which large quantities of fluid were found in the pleural cavities, I was certain, from repeated examination by percussion, that the effusion had not taken place till within a few days, or sometimes a few hours, before the fatal event; and in some instances it appeared that it must have occurred either during the last struggle, or subsequently to the death of the patient.

After pleurisy, however, hydrothorax occurs very commonly, either when the former has not been met by proper treatment, or has taken place in enfeebled subjects, or under circumstances causing relapses or aggravations of the inflammation. In some instances of even slight pleuritic seizures an effusion of serum rapidly takes place, and the death of the patient almost immediately ensues.

In a patient who lately came under my observation in Mercers' Hospital, of spare habit, greatly debilitated and emaciated from long-continued irritation of the stomach; there was no affection of the chest whatever; until one afternoon, when a cold breeze from an open door produced a pain in the left side, with slight cough, for which a blister and other applications were resorted to. His breathing continued unaffected till the following night, when his companions observed his rest to be disturbed, and he died early the next morning. On examination, the left pleural cavity was found filled with serum and masses of lymph of a gelatinous consistence, the lung being compressed towards its root against the spine. Death in this case was to be attributed to the suddenness of the occurrence rather than to its importance. When effusions of this kind take place gradually, the respiratory system is able to accommodate itself to the change, and the patient may endure it for a long time, even when it cannot be removed. As an illustration, I subjoin the following case.

Case XXI.

John Fea, a servant, aged forty-seven, admitted August 14, 1831. Pain in the back, shoulders, left side and head, aggravated by heat; a cough which occasions pain in the left side; dyspnœa, and a dragging pain in the left side caused by lying on the right; occasional rigors; pulse 76, weak; percussion dull on left side, both anteriorly and posteriorly; respiration puerile under right clavicle, and inaudible in left side. Complaint commenced with pain and cough about two months ago. Attributes it to cold contracted after being heated by a long walk. Hirud. xx. lat. sinist. pil. cal. et scill. tertiis horis; vesicat. axillæ sinist. potus tart. 17th. Severe pain in back last night. Mitt. sang. oz. x. cont. cætera. 18th. Blood not buffed; pulse 84; lies down with more ease, but not on his left side or back; cont. 21st. Hirud. xiv. lateri dolent. 22d. Cannot lie on left side or back; feeble respiration under the left

clavicle; ptyalism. R. Infus. junip. oz. vj. nitrat. potass. oz. ss. muc. g. Arab. tinct. scill. syrup. zinzib. singul. dr. vj. *m.*; sum. oz. j. ter in die; vesicat. lat. sinist. 23d. Pain in the left side gone; cont. mist. omitt. pil. 26th. No motion of the ribs on the left side takes place in respiration; no respiration to be heard on that side; percussion in the same universally dull; respiration in the right side puerile; pulse 88; severe pain at night along the spine; rept. venæsecto ad oz. x. pil. cal. et scill. mane; cont. mist. Sept. 13th. Hirud. xx. axillæ; cont. cætera. 14th. Pain abated; vesicat. axillæ; cont. pil. 17th. Tenesmus came on since last report; the pills were discontinued; moans at night; pain at lower part of left side; some respiration heard towards the spine, but only bronchial (i. e. in the larger air-tubes); other symptoms as before. Pil. cal. et opii h. s. m. sen. ad effect; hirud. xvj. reg. cord. 20th. Feels better; cont. pil. mist. junip, &c. 21st. Appears to have got cold; sonorous *râle* throughout right lung; severe dyspnœa; mist. cardiac. secundis horis. vesicat. sterno. 22d. Respiration easier: pil. cal. et opii statim et vesp. cont. mist. cardiac. cream of tartar whey. 27th. Since last report the respiration has been much relieved; pulse 88; lies on his back; ribs of left side not at all moved in respiration, those of the right side excessively so; percussion at left side universally dull; sleeps well at night; tongue coated; appetite gone; some diarrhœa the last three days. 28th. Died last night.

Necroscopia.—Left cavity of the pleura distended with serum containing shreds of organised lymph; lung thrust in towards its root, one adhesion alone remaining at the apex; pleura opaque; some red spots of vascularity on the diaphragm; lung nearly solid, sinking in water; heart thrust under the sternum; about two ounces of serum in the pericardium, and a large white spot on the surface of the heart, otherwise healthy; right pleural cavity nearly free from serum, with a few slight adhesions; right lung healthy.

In the above case the patient could not lie on the affected side, a circumstance to be attributed to the active inflammation of the diaphragmatic pleura of that side. Otherwise the general rule in pleurisy is, that in the first stage of pleurisy the patient lies on the opposite side; but when effusion has taken place to any considerable extent, then he lies on the affected side in order to keep the weight from the great vessels and opposite lung. I recollect to have met with only two cases in which there was no pain, and yet the patient could lie with comfort on the opposite side. In both, the fluid effused was confined to distinct cells of different sizes by strong adhesions, and was thus prevented from pressing on the great vessels at the root of the lung.

Effusion into the pericardium frequently occurs when the agony of death has been of long duration, and is thus often found to the extent of two or three ounces when no evidence of its existence had appeared during life. When of greater extent, and recognisable by symptoms, it is either the result of pericarditis, or connected with general dropsy; and in this latter case is not usual, except

when there has been disease of the valves. Sometimes it occurs in renal dropsy. With respect to its diagnostic symptoms, most of them are seen in the following case combined with those of open aortic valves.

Case XXII.

John Lyons, aged twenty-four, a tailor from Castlebar, admitted March 8th, 1833. Violent action of the heart; pulse 120, sharp, full; left decubitus easiest; right decubitus accompanied by a sensation of a weight falling from the direction of the heart; no pain produced by coughing; bounding of arteries; dull percussion to a considerable extent over cardiac region; an undulatory motion synchronous with the pulsation perceived there in the intervals of the ribs, and by pressure with the finger it is ascertained to be caused by the fluctuation of a fluid. Duration of present symptoms six weeks. Appears to have been caused by cold when suddenly getting up in a heat. Remembers from an early period to have been subject to palpitations. Mittant. sang. oz. xiv. R. Calomel granum; tart. ant. gr. ¼. digitalis granum; ext. gentian q. s. ft. pil. ter in die sumend. 9th. Pulse 96, softer; tenderness on pressure of the epigastrium below the region of the heart; rep. venæsectio. 10th. Cucurbit. reg. cord. mitt. sang. oz. xiv. 11th. Sleep improved and refreshing; pulse 100, still pungent; perstet. 12th. Nausea, and a sense of heat in the stomach; palpitations and irregularity of pulse when lying on right side; omitt. pil.; pil. cal. et opii meridie et vesp. tinct. digital. gutt. x. ter in die; cream of tartar lemonade. 16th. Ptyalism; pulse 116; omitt. pil. haust. efferv. c. spir. nit. dulc. gutt. vj. secundis horis; pediluvium. 18th. Pulse 120; mist. ros. cathart. R. Tinct. digital. gutt. lxxx. sp. nitri dulcis dr. ij. mucil. gum. arab. oz. iv. aquæ oz. iij. syrupi dr. vj. *m.*; sum. oz. j. ter in die. 20th. Pulse 120, very strong and sharp; vesicat. reg. cord. cont. mist. 21st. Soreness of mouth preventing sleep; in other respects as before; hirud. vi. infra maxillam; aceti opii gutt. xx. in haust. efferv. h. s. cont. mist. 22d. Pulse 94, less full; slept better; soreness of mouth less. 26th. Pain shooting from the sternum towards the left lumbar region; perstet. 29th. Pil. cal. et scill. h. s. cont. mist. 30th. Delirium during the night, with fits of insensibility; is unable to speak, but seems in pain; vomiting and diarrhœa; mittant. ex arteriâ temp. sang. oz. x. R. Mist. card. oz. vj. tinct. opii. dr. j. aq. menth. oz. ij. *m.* oz. j. secundis horis; vesicat. scrob. cordis. 31st. Pulse 120, sharp but compressible; vomiting has ceased; diarrhœa continues; does not speak, but appears in pain; head not hot; lies on both sides and on his back; abrad. capill. vesicat. nuch. cont. mist. April 1st. Died last night.

Necroscopia.—Above a pint of clear serum in the pericardium; serous membrane covering the heart towards its apex opaque; aortic valves thickened, so as to cause an open space in their central point of meeting; mitral valves thickened, yet not so as to

contract the opening, or to impede their function; left ventricle much hypertrophied; at the upper surface of the brain several spots of ecchymosis, and considerable vascularity; more fluid than usual in the ventricles; no morbid appearances observed in any other part.

The symptoms which occurred in all my cases of effusion into the pericardium were, inability to lie with ease on the right side; starts during sleep; fulness of the epigastrium under the pericardium; dull percussion over the the lower part of the cardiac region. The above symptoms always preceded, and often accompanied, by great frequency and pungency of pulse, with pain in the region of the heart; the latter not much increased by full inspiration as in pleurisy, but much aggravated by exercise. In several, the fluctuation of the fluid in the pericardium was visible through the integument, and by an experienced finger could be ascertained to be fluid, and not the movement of an enlarged heart; and in two instances the patients described a sensation as if a foreign body was underneath them when they lay on the left side.[1]

This disease is generally tedious, and often refractory to treatment. The best results in my experience were obtained from pills of calomel and digitalis, of each a grain, and extract of the acetum colchici two grains, to be taken thrice daily, along with frequent leeching and blistering over the region of the heart. When the heart's action was marked by unusual strength and violence, quarter-grain doses of tartar emetic were combined with calomel. In all cases the question of general bleeding was decided by the strength of the pulse, and the effects of it, as before observed. Purgatives, although often necessary, yet when used so as to produce irritation of the stomach and flatulence in the colon, cause great distress. Under those circumstances a draught of a quarter of a grain of watery extract of opium, and twelve drops of aromatic spirit of ammonia in camphor mixture, afford much relief. In general it is advisable, as much as possible, to withhold opiates for the procurement of sleep, as they mask the real state of the patient; and until the excitement of the circulation has been to some degree lowered, produce only a stupor with uneasy dreams prejudicial both to comfort and the favourable progress of the case. When however in this stage sleep has been much interrupted, it may often be procured without any disadvantage by either two grain doses of Dover's powder every three hours, or one eighth of a grain of acetate of morphine at the same interval, beginning in the afternoon, and aided by the pediluvium at night.

Hydrocephalus.—This disease, which is still best understood by the public under the name *water on the brain*, is yet so little of a dropsical nature, that in many cases no fluid whatever, but on the

[1] Here it is not intended to give a diagnosis of pericarditis so much as of hydrops pericardii. For an account of the sound produced when shreds of lymph are formed in the pericardium, see Dr. Will. Stokes's paper in the Dublin Medical Journal.

contrary an unusual dryness, is found in the ventricles. A late eminent practitioner of this city, who was well aware of this fact, was known, when attending *post mortem* examinations in this disease in presence of the patient's friends, to keep a sponge filled with water concealed in the palm of his hand, in order to afford a ready supply whenever the ventricles were empty. Nor is this error of believing the disease to consist in a collection of fluid confined to the non-medical portion of the public. Much light has been diffused on the subject since the publication of Dr. Quin's work, and we have many excellent practical treatises on it; but the confusion which still prevails as to its pathology and peculiar symptoms induces me to take this opportunity of stating my views on the subject.

There are three seats of disease within the cranium, which, although often simultaneously affected, and so giving rise to numerous complications, yet by comparison of individual cases may be proved to produce the following symptoms.

1st. The membranes of the brain, when affected (as in arachnitis), are the seat of pain more or less intense, which is increased by pressure, like that of all inflamed serous membranes, as may be tried by coughing or sneezing. When inflammation has proceeded to a certain extent, then so large a quantity of fluid may be effused within the cranial cavity that the space occupied by the blood-vessels is so much curtailed that the necessary circulation cannot be carried on, and coma ensues.

2dly. The cortical structure, when inflamed, causes delirium. The frequency of delirium in arachnitis arises from the proximity of the membranes to the cortical structure, in consequence of which excitement of the former is readily extended to the latter. For the changes of the cortical structure which have been observed in mental diseases, see the work of Dr. Foville.

3dly. The medullary structure is the seat of paralysis, when either pressure or disorganisation of it has taken place: when not thus affected, but irritated, then convulsions are the result.

Those principles will be found to furnish a clue, by which we may diagnose most affections of the head, and also satisfactorily explain the apparent exceptions.

Hydrocephalus, although not dropsy of the brain, as held by the older writers, nor phrenitis, yet is different from arachnitis, with which the moderns have endeavoured to identify it. It is to be distinguished from arachnitis first by its seat, which is not the membranes, but the substance of the brain; and secondly, by its symptoms. In it the septum lucidum is soft, so as not to be capable of being demonstrated, while the fornix and commissures are of the consistence of thick cream. The strabismus which occurs towards its termination belongs to no other disease of the brain, and appears to arise from the disorganisation now mentioned, by which the connection between the hemispheres is dissolved. Again, the disease forms in a gradual and often unperceived manner, such as might be judged to belong to slow disorganisation of the brain; and the

febrile attack, for which medical assistance is usually too late invoked, is only its termination. This, it is true, is generally attended with arachnitis, and consequent serous effusion; but the judgment as to the mode of its formation and probable fatal tendency is always to be formed from the existence of the previous symptoms.

The following case is subjoined as a specimen of this disease, presenting its most important features.

Case XXIII.

Master A., April 6th, 1833. Is in a state of insensibility; strabismus; eyes partially closed; conjunctiva of right eye suffused; pupils dilated. On exposure to light, the pupil of the right eye contracts, while that of the left continues dilated. Face appears drawn towards the left side; moanings frequent and half suppressed, resembling those of a person labouring under night-mare; seems slightly conscious when the head or any part of the body is touched; and when a moxa was applied, the motion of the hands and convulsive curl of the mouth to the left side indicated a sense of pain; pulse 120, weak; bowels confined; occasional hiccup; an accumulation of froth around the mouth.

Is reported to have been ailing the last three weeks, his complaint having been considered as a bilious fever. During nearly four months previously, he has been observed to be more reserved than usual. He absented himself from his accustomed amusements, and confined himself within doors. He constantly kept near the fire. He also used to complain of a pain in his right temple, and of his sleep being disturbed by frightful dreams. While reading some time ago, he suddenly started up and said that something like a film had come over his eyes. Insensibility came on unexpectedly yesterday. Leeches, blisters, and moxas, have been applied, and he has taken forty grains of calomel; enema statim; lotio frigida temporibus; cal. gr. iv. quartis horis. 7th. Copious dark coloured dejections passed involuntarily; sumt. cyanureti hydrar. grs. omni hora. ad 6 *m.* vicem. No change in the symptoms took place, and he died on the following day.

Necroscopia.—Head: between the arachnoid and pia mater towards the occiput in both hemispheres an effusion of bloody serum. Substance of brain with red dots more than natural. Softening of the lower surface of the fornix, and an almost complete obliteration of the septum lucidum. About two ounces of transparent serum in the left ventricle, none in the right; the lining membrane of the left ventricle unusually distinct and easy to be separated.

No examination of the abdomen would be permitted.

The preparatory stage, which was well marked in the above case, is at an earlier period of life denoted by frowning without any extrinsic cause, by starting from sleep, or by frequent application of

the hand to the head, with general dulness, or peevishness. In younger subjects also strabismus occurs at an earlier period.[1]

Although the evidence before me points out strabismus as a symptom of disease of the central part of the brain, yet I have seen recoveries after it has occurred, and very lately I observed it in a gentleman about twenty years of age, while in a state of coma, in a fever, of which he recovered. In this case however the symptoms bore a resemblance to those of hydrocephalus, and during several weeks before the febrile attack, he was observed to keep to the fire, and to be unusually silent and fond of solitude.

In another case which occurred lately of what was considered hydrocephalus in a child, but which wanted this distinctive mark, viz. strabismus, on examination after death, much fluid, but no softening of any part of the brain was found.

That form of chronic hydrocephalus which is attended with enlargement of the head, and opening of the sutures, is to be considered as chronic arachnitis, in which the stage of coma is postponed by the increased room afforded by the effused fluid. Those cases have become much more rare than formerly, in consequence of the attention to the state of the bowels, and other improvements in the management of children which have become general of late years.

For the treatment of the preparatory stage of hydrocephalus, I am enabled to recommend repeated mercurial purgatives, blisters behind the ears, and if there be heat of the head, leeches. By these, and similar means, the progress of the disease is easily arrested, while on the contrary, if suffered to proceed to the latter stages, it is all but hopeless.

In the latter stages, leeches, counter-irritants, and mercurials, are our most valuable means. In some cases I used the cyanuret of mercury, which although apt to nauseate, yet has the effect of producing salivation with rapidity, and is destitute of either acrid or narcotic qualities. Sinapisms made of strong mustard and water, without any addition, and applied to the back of the head, or in bags enveloping the feet and ankles, are far superior to blisters in rousing from coma. With regard to opiates an unfounded prejudice exists; they are imperatively required, whenever, notwithstanding the use of the remedies now mentioned, wakefulness continues constant. In case of sleep disturbed by moans or starts, the patient should be awakened, as that state produces more fatigue than the rest, and small doses of Dover's powder will then be sometimes found to change this restless sleep into refreshing slumbers, with improvement of all the symptoms.

[1] To avoid misconception, let it be remembered that there is strabismus, 1st, in early infancy, before the eyes have been accustomed by habit to move in the same axis; 2d, in some, when not looking with sufficient attention, or in laughing, &c.; 3d, in irregular gout from affection of the muscles of the eye; 4th, in some, in a permanent form, from habit: all of those are to be distinguished from the above.

ON

DISEASES OF THE BLADDER.

BY WILLIAM COULSON, SURGEON.

ADVERTISEMENT.[1]

In the following pages my chief object has been to establish clearly, the distinction between the inflammatory diseases which attack the several coats of the bladder. It has appeared to me important, that these affections should not be confounded under the general character of inflammation of the bladder, as not only are they distinguished from one another by their symptoms and progress, but as each of them requires an essentially different treatment. I have also considered irritation, paralysis, and some other disorders of the bladder, as they stand in close connection with inflammation of this organ.

The substance of the chapters on inflammation formed the subject of the oration delivered this year to the Hunterian Society.

Frederick Place, Old Jewry, March, 1838.

CHAPTER I.

IRRITABILITY OF THE BLADDER.

This term is usually employed to denote any affection of the bladder which is attended with frequent desire to void the urine. I wish, however, to express by it, a frequent and often irresistible desire to void the urine, sometimes, but not always attended with pain, and not arising from inflammation or any of the organic affections of the bladder or prostate gland.

The frequent desire to pass the urine is the chief symptom of this complaint. A person having enjoyed good health, feels suddenly a desire to void urine every half hour, or oftener; and the desire is so strong, that unless he yields to it at once, the urine passes without his being able to prevent it; or if he succeeds in checking the desire, uneasiness or pain, or even paralysis of the bladder, is apt to occur. The voiding of the urine is sometimes,

[1] On Diseases of the Bladder. By William Coulson, Surgeon. 12mo. pp. 153. Lond. 1838.

but not always, attended with pain in the glans penis, or under the frænum, and with violent efforts or straining.

The urine is voided (except in hysterical subjects) in small quantities; and although such quantities are frequently passed, the aggregate does not much exceed that of a person in health. It is necessary to bear in mind that the quantity of urine passed in twenty-four hours by a person in perfect health, varies even when he makes no difference in his mode of living or exercise. Rye considered forty ounces an average quantity in the twenty-four hours; whilst Dr. Prout reduces it to thirty-two. The number of times a healthy subject discharges urine is also uncertain, usually varying from six to fourteen times; and occasionally a person in good health will be found who passes urine only twice in twenty-four hours. Hysterical patients sometimes suffer from irritable bladder, and experience great pain in passing urine. In these patients, the quantity is often considerable, and possesses the peculiar character designated by Dr. Bostock[1], "aqueous," containing less than the usual proportion of solid matter, without any other change in the nature or relative quantity of its constituents.

Opportunities for examining after death the bladders of those who labour under idiopathic irritation of the bladder are exceedingly rare. I examined, with Mr. Woolterton, of Euston Place, the body of a gentleman, of a very nervous temperament, who had long laboured under irritation of the bladder, and who was carried off by an affection of the lungs, but we could not detect the least alteration in the appearance or structure of the bladder or any of the urinary organs.

After long continued irritation, the bladder becomes diminished in size, and instead of containing a pint or upwards, it is incapable of holding more than two or three ounces at a time. Notwithstanding this contracted state of the bladder, if there be no stricture or disease of the prostate, its parietes are often thinner than natural.

Irritation of the bladder often depends on obvious causes, as pressure of the womb in pregnancy, stricture of the urethra, hemorrhoids and foreign bodies in the bladder: after the operation for stone also, the bladder often remains in an irritable state. The bladder is liable to irritation in almost all cases of stricture; but, if there be no alteration in the structure of the organ, this subsides when the stricture is removed. Sometimes the slightest derangement in the digestive organs will, by disturbing the functions of the kidney, cause irritability of the bladder. Adults, and children, more particularly, are, from eating fruit, very liable to this affection in the summer season. In these cases, the urine contains an excess of acid, either of the lithic acid, or of the lithate of ammonia.

Sometimes it is produced by taking for too long a time alkaline remedies; and, in this case, the urine is of course alkaline. I was consulted for irritability of the bladder by a gentleman, whose urine was alkaline, but whose appearance and state of constitution did not

[1] Cyclopædia of Practical Medicine, vol. iv. Article, Morbid condition of Urine.

at all lead me to expect this condition of the urine. On enquiry, I found that he had for a long time been taking the sesquicarbonate of soda in large doses. I ordered him to discontinue the use of this medicine, and he soon recovered. The altered state of the urine is the immediate cause of this complaint; and, in these cases, the condition of the urine should especially engage our attention.

Gouty and rheumatic persons are frequently subject to this complaint. A patient having irritability of the bladder, applies to his medical man, who, on enquiry, finds that he is occasionally subject to pains in the limbs and loins, to some scaly eruption on the skin, and sickness of a morning. The urine is usually passed in small quantities, is very acid, and contains a large quantity of the lithate of ammonia.

The following case illustrates this common form of the complaint. A gentleman forty-two years of age, and subject to rheumatism, applied to me on the 11th of February, 1837, on account of a very frequent desire to pass urine, from which he had suffered for several years. There was a scaly eruption on several parts of the body, particularly about the elbows and knees, and he often felt severe pains in the hips and loins. The urine was very acid and scanty. I ordered him the following mixture:—R. Infus. diosmæ ʒxv.; Tinct. hyoscyam. ʒiij.; Potass. bicarb. ʒiss.; Extract. fluid. Sarsap. ʒiv.; Cap. coch. ij. vel iij. ampl. ter in die. And I gave the following pill at bed time: R. Pil. hydrarg. gr. iij.; Pulv. rhœi. gr. ij. On the 3d of March, the irritability of the bladder was much lessened, and the eruption improved. I then gave the decoction of the pareira brava in the day, with a grain of the acetous extract of colchicum at bed time. His complaint was much relieved, but not cured.

Scybala in the intestines will give rise to this complaint.

For practical purposes,[1] it is sufficient at present to observe, that there is not only a sympathy betwixt the bladder and the other parts contained within the pelvis, by which the diseases of one may be mistaken for those of the other; but certain parts of the intestinal canal through its whole extent, sometimes the stomach, sometimes the ileum, often the colon, and still oftener the rectum, being the seat of irritation, will produce sensations in the bladder, the perineum, or urethra. These will fill the mind of the sufferer with the most serious apprehensions, and lay him open to the mistakes of ignorance.

Various mental emotions, as grief and anxiety, cause this complaint, and it is often connected with a peculiar state of the nervous system. "An elderly man, for example," says Brodie,[2] "complains of frequent attacks of giddiness. In walking his head turns round, so that he is in danger of falling; and this symptom probably arises from an altered structure of the arteries of the brain, causing an imperfect state of cerebral circulation. Not unfrequently this is

[1] Bell's Institutes of Surgery, vol. i. p. 279.
[2] Lectures on the Urinary Organs, 2d edition, p. 75.

attended with an irritable state of the bladder; and although the urine is of a healthy quality, and the bladder itself is free from disease, the patient is tormented by a constant micturition, voiding his urine without pain, but at short intervals, and in small quantities at a time."

I have known irritation supervene on paralysis of the bladder. A gentleman, during an attack of typhus fever, nine years ago, was seized with an inability to pass urine, requiring it to be drawn off twice a day. However, as he gained strength, the power of voiding the urine returned, but the desire to pass it became then so frequent as to compel him to go every half hour. He consulted me for this symptom on the 25th of November, 1835. There was no disease in the urinary organs, and his general health was good, with the exception of occasional rheumatic attacks. The urine was very acid and scanty. I ordered him a grain of the acetous extract of colchicum at night, and ten grains of bicarbonate of potass, seven of sesquicarbonate of soda, and four of the nitrate of potass, twice or three times a day, soon after his meals; and by these means the urine became more abundant and less acid; but the frequency of passing the urine continued the same. I then tried the infusion of diosma, the decoction of the pareira brava, and various preparations of steel for the relief of this symptom, without success.

This complaint is, in many cases, likely to be mistaken for some of the inflammatory affections of this organ. The distinction, however, is easy, and of great practical importance. If the complaint has recently occurred, it may be distinguished from the acute inflammation of the bladder by the absence of pain and of those severe constitutional symptoms which belong to the latter complaint. If, on the other hand, it has been of very long standing, the general health suffers but little; whereas, in chronic inflammation of the bladder, the constitutional powers sooner or later give way. In the following case, the health was but little affected, and the complaint was of very long duration.

A gentleman sixty-five years of age, of a good constitution and regular habits, consulted me on the 4th of December, 1835, on account of a very frequent desire to pass his urine, unaccompanied with stricture or disease of the prostate, or any other affection that I could detect. Thirty years ago he applied to Mr. Jesse Foot, for the same complaint; and the lotura vesicæ was then tried on him without any relief. This symptom has continued ever since, being aggravated in cold weather, and on any excess in living or derangement in the health. In other respects, he is quite well.

The cause of the irritability is sometimes supposed to be confined to the bladder, when in fact this organ is not at all affected, but the kidneys are the source of the complaint; and these cases are attended with great obscurity.

Morgagni[1] relates a case in which the bladder was the seat of sympathetic pain; the disease being in the kidneys. The patient,

[1] On the Seats and Causes of Disease, Letter 42.

he says, complained of very little pain in the region of the kidney; while he was tormented with pain in the bladder, so excruciating that five or six physicians who attended him, entertained no doubt that the seat of the disease was in that organ. On dissection, however, no morbid appearance was discovered in the bladder, but there were large and ramifying calculi of the kidney.

In certain renal affections in particular habits, says Dr. Prout,[1] even where the urine is not very unnatural, the pain is confined chiefly to the neck of the bladder; but when the urine is actually diseased, and more especially alkaline, we may be certain that the kidney is functionally, and if the patient be of a scrofulous habit, and the case of long standing, very probably organically affected.[2]

Where a case of irritability of the bladder comes under the notice of the surgeon, the first and great object of enquiry, is the cause on which the irritation depends. In many cases, the causes are obvious, as in stricture, foreign bodies in the bladder, &c. on the removal of which the irritation subsides; in other cases, the exciting cause is involved in great obscurity, and the complaint continues in spite of all the remedies which we employ.

In idiopathic irritability of the bladder, where it has not been of long continuance, the treatment is usually plain. The state of the general health and the condition of the urine must be our guide. In gouty and rheumatic subjects, where the urine is generally acid and scanty, and red sand is often passed, the alkalies should be administered; and a good form for their exhibition is a combination of the potass, soda and nitre.[3] Dr. Prout recommends the carbonate of potass, in preference to the carbonate of soda, because the soda, under certain circumstances, enters into combination with the lithic acid, forming an insoluble salt, as bad as the lithic acid itself, whereas the lithate of potass is perfectly soluble, and if this combination should take place, it will pass off dissolved in the urine. In addition to the alkalies, the acetous extract of colchicum, in[4] doses of one or two grains at bed time, should be given; and if the digestive powers be weak, as is often the case, some tonic as the infusion of cascarilla, or columba, or hop, will be found serviceable a short time before meals.

In these and indeed in all cases, the strictest attention should be paid to diet; vegetables and fruit should be avoided, as well as wine, spirits and all fermented liquors. In some constitutions, notwithstanding the acid state of the urine and the deposition of a

[1] Inquiry into the Nature and Treatment of Diabetes, Calculus, &c. 2d edition, p. 315.

[2] Some interesting cases of irritation of the bladder caused by disease of the kidney are related by Mr. Henry James Johnson in the Medico Chirurgical Review, vol. xxix. p. 193.

[3] R. Bicarb. potass. 3j.; Sesquicarb. sodæ, 3vj.; Potass. nitrat. 3ij. As much of this powder as can be put on a sixpence, to be taken twice or three times a day, in water, soon after a meal.

[4] R. Extract. aceti colchici, gr. j. vel ij.; Pulv. glycyrrhizæ, q. s. A pill to be taken at bed time.

large quantity of the lithate of ammonia, the alkalies disagree, producing restlessness, giddiness, and uneasiness about the region of the stomach.

I recently saw, with Dr. Prout, a gentleman who had great irritability of the bladder, and whose urine was very acid and deposited great quantities of the lithate of ammonia, but who could not bear even small doses of alkaline remedies.[1]

If the patient be of a nervous temperament, and the urine be alkaline, a different plan of treatment will be necessary. The dilute mineral acids,[2] combined with the decoction of pareira brava, should be administered, and every thing that has a tendency to lower the system, as attention to business, study, or anxiety, should be studiously avoided. In other cases, where the urine is neutral, the extract of the uva ursi,[3] combined with extract of hop or hyoscyamus, may be taken, and opiate suppositories,[4] or injections with some drops of the liquor opii sedat. according to the severity of the symptoms, may be administered. The decoction of uva ursi,[5] and the infusion of wild carrot seeds,[6] will occasionally give great relief. But, in my experience, no medicine has been so often successful in irritability of the bladder, as the diosma in the form of an infusion.[7] I could cite several cases, where it has succeeded after other medicines had failed. A young gentleman, æt. 21, applied to me, May 25th, 1834, on account of an affection of the bladder; and said that, for the last eleven or twelve years, he had experienced great difficulty in retaining his water for any length of time, being obliged to leave any company in which he was, once or oftener in the hour. The moment the desire to pass the urine came on, the water passed away involuntarily, unless the desire was immediately complied with. This irritability of the bladder was always very much aggravated after taking malt liquors, wine, spirits, and on exposure to cold, and had considerably increased during the last twelve months. He was very susceptible of cold, complained of pains down the inside of the thighs, but he had no pain in the region of the loins

[1] In such cases the following mixture may be given. R. Spirit. ammon. aromat. ʒij.; Spirit. æther. nit. ʒij.; Tinct. Hyoscyam. ʒij.; Mist. camph. ʒv. A fourth part to be taken three times a day.

[2] R. Acid. nitric. dil. ʒi.; Acid muriat. dil. ʒss.; Aquæ distillat. ʒviij. Two tablespoonsful to be taken three times a day.

[3] R. Extract. uvæ ursi gr. v. Extract. humuli vel hyoscyam. gr. iii. Two pills to be taken three times a day.

[4] R. Pil. Saponis cum opio gr. vij. To be introduced within the rectum at bed time.

[5] R. Folior. uvæ ursi ʒi.; Aquæ ferventis ʒxx.; coque ad ʒxvi. A third part of a pint to be taken three times a day.

[6] R. Seminum dauci contusorum ʒi.; Aquæ ferventis ʒxvij.; Macera per horas iv.; dein cola. A third of a pint to be taken three times a day.

[7] This is to be prepared according to the formula in the London Pharmacopæia. If there be scaly eruptions, and the urine very acid, the following form will be found of service: R. Infus. diosmæ ʒvij.; Potass. bicarbon. ʒi.; Tinct. hyoscyam. ʒiiss.; Extract. Fluid. Sarsap. ʒiv. Two table spoonfuls to be taken three times a day. If the urine be not very acid, the alkali must be omitted.

on pressure nor over the bladder, and his general health had not suffered. The urine was light coloured, and neutral in its character. After trying the various preparations of steel, the decoction of the pareira brava, henbane in different forms, without success, I ordered the infusion of diosma, which he took for some time with great benefit.

Mr. Jesse Foot, as is well known, was a great advocate for injecting the bladder in cases of irritation of this organ, but the plan since his time has never been extensively tried. Mr. Wadd mentions two cases in which great relief was experienced from the lotura vesicæ, and expresses his surprise that it is not more resorted to by practitioners.

In the irritability of the bladder which is met with in young females, just at the time when menstruation may be expected, or when some irregularity in this function has occurred, the preparations of iron are of great service. The ammoniated or the muriated tincture of iron, given in some light bitter infusion, will be found serviceable; and if the bowels be costive during the use of this remedy, the compound decoction of aloes should be daily administered. The bowels should be kept well open, for the symptoms of the disease are invariably aggravated when the bowels become costive. If there be much hysteria, the tincture of valerian, combined with the vinum aloes, may be also tried with benefit.

Incontinence of urine in children usually depends on an excitable state of the bladder, or an altered condition of the urine. It occurs during sleep, and the urine is often passed off voluntarily under the influence of a dream. In other cases, it is more of a passive character, and passes involuntarily. In some cases, this involuntary passing of the urine continues by day as well as by night, and then the patient suffers more or less from this complaint during the remainder of his life. In such cases, the children should be waked up in the night, twice or oftener, for the purpose of passing the urine; and they should not be allowed to take late meals, or much liquid for some time prior to retiring to rest. In fact, they should not, at any time, be allowed to take much liquid. Lying on the back in bed tends to keep up this complaint, and should be guarded against. Cold bathing, preparations of iron, and other tonics, will be found of great use. If the complaint continues after puberty, the tincture of cantharides is often very serviceable.

It is frequently connected with a weak and scrofulous state of constitution; and in these cases, all remedies are often unavailing. I lately saw a child six or seven years old, with a large head, pale countenance, bad teeth, prominent sternum, large abdomen, and emaciated extremities, who had suffered from incontinence of urine from its earliest infancy. All kinds of remedies had been tried without any success. I may just observe that, in this case, as well as many others, there was great irritability of the bladder during the day time, and, unless the desire to pass the urine was attended to, it flowed off involuntarily. The urine was very acid.

Incontinence of urine is sometimes the effect of stricture in the

urethra, and will subside on the cure of the stricture. In other persons, particularly stout females, the urine will flow involuntary on lifting a weight, or coughing, or any violent exercise. In these cases there is no pain, no blood in the urine, no desire to make water often, simply the involuntary flow on exertion, the action of the diaphragm, and abdominal muscles overcoming that of the sphincter of the bladder. In females, it often occurs after distension of the urethra for the extraction of calculi or foreign bodies, and occasionally after difficult labours.

CHAPTER II.

PARALYSIS OF THE BLADDER.

This is the opposite state of the bladder to that which we have just been considering, although one sometimes supervenes on the other.

Partial paralysis of the bladder may exist for some time without exciting attention, a sufficient quantity of urine flowing from the bladder without its being perfectly emptied.

But when more complete paralysis supervenes, and the patient has not lost all sensibility, he complains of great uneasiness and oppression or weight in the region of the bladder, and finds himself incapable of voiding urine, notwithstanding all his efforts to do so.

This complaint comes most frequently under the notice of the surgeon as the effect of the injuries or diseases of the spine; and these cases are attended with important changes in the condition of the urine, as well as the whole urinary system.

"In some cases," says Brodie,[1] "the urine which is first secreted, although of an acid quality, and free from mucus, has a peculiarly offensive and disgusting odour. In other cases, the urine is highly acid, having an opaque yellow appearance, and it deposits a yellow amorphous sediment. But the most common change produced in the urine by an injury in the spinal chord, is the following. It is voided of an ammoniacal odour, and turbid; when allowed to cool and remain at rest, it deposits a large quantity of adhesive mucus; and, when tested with reddened litmus or turmeric paper, it is found to be highly alkaline. After some time, a quantity of white matter (phosphate of lime) may be detected in the mucus, and it is tinged with blood. At a still later period, a considerable quantity of coagulum of blood is blended with the mucus and urine."

An opinion has been entertained that the ammoniacal condition of the urine in these cases is owing to imperfect nervous power influencing the kidneys, and that, when the spine is hurt, and there

[1] Medico-Chirurgical Transactions, vol. xx.

is consequently paralysis, there is a changed condition in the secretion of urine. Mr. Curling, in a paper published in the Medical Gazette, contends that the condition of the urine and of the bladder are the direct result of the paralysis.

Dr. Burne, in reply to this view, says, "in all the cases witnessed by myself, in which ammonia has existed in the urine, there has been sufficient grounds for attributing its presence to the decomposition of the urine in the bladder. I have long been of opinion that its source is in this organ, and that it does not arrive ammoniacal from the kidney. Independently, indeed, of clinical evidence, there is extreme difficulty in supposing ammonia to be derived from the kidney, seeing that the kidney itself is not affected by it, while the bladder becomes most seriously diseased; and yet the organic sensibility of the mucous surface of the kidney is precisely similar to that of the bladder; both are adapted to the stimulus of healthy urine, and both would be equally affected by any foreign irritating ingredient. Supposing for a moment, that disease was excited in the kidney, suppression of urine would ensue as a necessary result of the inflammation; but the urinary secretion is not arrested, a proof that the kidney is not involved, except it may be slightly and sympathetically."

If then, in cases of ammoniacal urine, the kidney remains sound, while the bladder becomes diseased, it follows that the ammonia cannot be present in the urine coming from the kidney; and further, that the ammonia must be formed in the bladder.

This question is altogether one of great importance, and requires further observation before it can be determined. If the first opinion alluded to be correct, little relief can be afforded excepting in so far as the paralysis itself may be relieved. On the other hand, if the evolution of ammonia and the inflammation of the bladder be the effect of the retention, the prospect is more cheering.

Lallemand observes,[1] that we must ascribe to a diminution of sensibility, the distension of the bladder and the inflammation of its mucous membrane, observed in diseases of the brain and its membranes, when such diseases are accompanied with stupor, drowsiness, &c. The patient makes no effort to expel the urine contained in the bladder, because he does not feel the impression made by it; it consequently accumulates and distends the parietes of this organ as long as they admit of it, until the resistance which the urine experiences from them, being greater than that presented by the neck of the bladder, the urine dribbles away in the same proportion, and with the same slowness, as it is conveyed by the ureters—that is, drop by drop.

This complaint often attacks elderly persons, particularly gouty and rheumatic subjects, and is the result of general diminution of muscular and nervous power, the bladder being incapable of obeying the will with the same facility as before, and being less sensible to the stimulus of the urine.

[1] Letter ii. p. 236.

It is also often brought on by neglecting to expel the urine when it is accumulated. A person, not being conveniently situated for emptying his bladder, neglects the first call, and allows it to become distended; the desire perhaps goes off; a large quantity of water accumulates; the bladder rises up to the umbilicus, or even higher; and when he attempts to empty it, he finds he is totally unable to do so, and that he cannot void any water at all.

Patients ought never to resist the first desire to make water; for, in not obeying this inclination, the bladder distends; the elongated fibres lose more and more their sensibility; the desire to make water passes off; the retention, which, in the commencement, was only partial, then becomes complete; and there is no stimulus sufficiently strong to excite the bladder to expel the urine which it contains.

When the bladder is distended to a certain degree, the urine flows off involuntarily; and, at this stage, it has happened, that the paralysis of the bladder has been overlooked, especially in corpulent persons, and incontinence has been supposed to exist, whilst, in reality, the bladder was full and could hold no more. In the case, therefore, of a person who may complain of not being able to hold his water, especially an old person, and when the water is flowing off involuntarily, the surgeon ought not to give any opinion about it till after he has, at all events, laid the hand upon the abdomen, and felt whether the bladder is distended or not, for very serious consequences may be produced by a mistake of this kind. In illustration of this important subject, Mr. Lawrence mentions the following interesting case:—"It happened to me, a good while ago, to be sent for, to see a gentleman labouring under an affection of the bladder; and the medical attendant who had lately seen him, mentioned that the case was one of great irritability of the bladder—that it would hold no water at all—the urine passing off as fast as it came into it. He said he had been doing all he could to get the natural power of retention of the bladder restored; he had directed the patient to take diluent fluids; in short, he had done all he could to prevent it; but still the water ran off. It appeared to be a singular case. I put my hand under the clothes upon the abdomen, and I felt the fundus of the bladder forced up a good way above the umbilicus; I said I had brought a catheter with me, and that I might as well introduce it, to see if there was any thing in the bladder. I introduced it, and about five pints of urine immediately flowed out. The fact was, the bladder had been allowed to distend in this way for about five days before I saw him; and the consequence was, that that gentleman never recovered the natural power of emptying the bladder afterwards; but he, after a certain time, acquired the art of introducing the catheter, which he still employs. He can introduce it, and let off the water whenever he finds a desire to do so; but he never has been able to empty the bladder by the natural powers since that time."

If, by the use of the catheter, the bladder should recover its

natural power, the patient must be strongly impressed with the importance of never again allowing the urine to accumulate to such an extent, but immediately, and as often as he feels the smallest inclination, to pass urine, or if unable to expel it, to make timely use of the catheter. The patient ought also to be informed of the necessity of voiding the urine on every occasion to the last drop.

Although the complaint is often met with in old persons, it not unfrequently occurs in persons under thirty-five or forty years of age, whose constitutions have been impaired by venereal excesses, long courses of mercury, anxiety, fatigue, and over attention to business. Prior to the attack, the patient complains of pain in the head, or some part of the back, weakness in the loins, and inability to walk firmly; flatulence, or a sense of fulness in the region of the epigastrium; and he looks and feels as if threatened with some impending mischief. If these symptoms be not relieved, paralysis of the lower extremities follows, and his bladder partakes of the affection. I recently attended, with Mr. Ireland, of Artillery Place, a case of this kind, which terminated fatally in eight weeks. The use of the catheter twice, or occasionally three times a day, was required from the commencement of the illness. At first, the urine was of a deep red colour, very acid, and without mucus; towards the close of the illness, mucus was secreted in abundance, and the urine became alkaline. I have known, however, paralysis of the bladder occur where the previous habits were regular, and the state of health was in other respects good. With Mr. Dunn, of Norfolk street, I last year attended a gentleman about thirty years of age, extremely nervous, who had been labouring under considerable mental excitement. We were sent for to this gentleman, suddenly, on account of retention of urine; the urine was drawn off by the catheter, and this was repeated twice a day for ten days, at the end of which time the power of the bladder returned, and he was able to make water himself. The retention arose entirely from a paralysed state of the bladder, owing to diminution of nervous power; there was no stricture, or gonorrhœa, or local impediment to the passage of the urine.

Paralysis of the bladder comes on in typhus fever, some cases of compound fracture, or severe injuries of the lower extremities. In the case of a lady on whom I operated for hemorrhoids, the bladder became paralysed, and she required the use of the catheter for some days before the bladder recovered its usual power.

Paralysis of the bladder occasionally occurs from the use of opiate suppositories, or injections; so that it has been necessary to draw the water off, and much alarm has been occasioned by it.

I may allude to a few of the causes which deprive the bladder of the power of expelling the urine, although the bladder cannot be said, under these circumstances, to be in a state of paralysis.

The rectum may be distended by flatus, blood, morbid growths, or any foreign body; and in these different states, the neck of the bladder and the urethra may be compressed.

I last year attended, with my friend, Mr. Brown, of St. Mary Axe, a case of diseased hip joint, in which matter had made its escape from the affected joint into the pelvis, so as to press on the neck of the bladder, and had caused paralysis of this organ. On examination, after death, we discovered that the matter had escaped through the acetabulum to the posterior part of the bladder, close to its neck.

There are two periods in pregnancy[1] when women are particularly exposed to retention of urine—about the fourth month of pregnancy, and at the time of confinement. To have an exact idea of this state, it must be recollected, that, in the first month, as before conception, the womb continues concealed in the pelvis; that it does not mount above the cavity till the fifth month, and sometimes even later; that until that time, its size and weight having progressively increased, it descends lower towards the vagina, and, in the manner of a wedge, presses posteriorly the rectum, and anteriorly the neck of the bladder, and the urethra against the symphisis of the pubes, even to such a degree, as to stop the opening of this canal.

The displacement of the viscera, which so often gives rise to retention of urine, are retroversion of the womb and prolapsus of this organ, of the vagina and of the rectum. If we examine the intimate connection of the bladder both with the womb and vagina in the female, and with the rectum in the male, it is clear that the parts cannot be displaced without drawing with them the bladder; and that, in this displacement, whatever may be the contractile force, it cannot entirely expel the urine which it contains.

In the prolapsus and retroversion of the womb and vagina, and of the rectum, the posterior part of the bladder, instead of being carried upwards and forwards, is drawn downward and backward, and the curve of the urethra is entirely changed. Instead of presenting a concavity beneath the pubes, as in retroversion, the bladder presents there a convexity, a derangement which must not be lost sight of in the introduction of the sound.

The morbid appearances presented after death, are dilatation of the bladder, attenuation of its coats, and a pale white appearance of the mucous membrane; at least, these are the appearances found when the mucous membrane of the bladder and the kidneys have not been seriously involved in mischief, as after injuries of the spine. In this latter case, there is great vascularity of the mucous membrane lining the bladder, ureters, and the pelvis and infundibula of the kidney. The mucous surface of the bladder is thickened and of a slate colour, and presents, here and there, dark red spots. Sometimes the surface is covered with phosphate of lime, which has been deposited from the mucus, or a white powder is often found in the mucus itself, and the bladder contains some fetid urine.

In the treatment of this complaint, the first and immediate step

[1] Traité des Maladies des Vois Urinaires, par J. P. Desault, p. 160.

required, is to draw off the accumulated urine by means of a catheter; and the operation should be repeated twice, or even oftener, in the twenty-four hours, (at intervals sufficiently short to prevent over distension,) until the bladder has recovered its contractile power. If the complaint has not arisen from organic mischief, and the patient is not very old, recovery may be expected to take place; and as the bladder recovers its tone, the patient says he fancies he could pass a little urine; and on making the effort, voids some, either drop by drop, or in a small stream. As the recovery begins to take place, the catheter should be less frequently employed, until its use be entirely superseded. In other cases, particularly in elderly persons, the bladder never recovers its tone, and the use of the catheter will be required as long as the patient lives. In the paralysis of the bladder dependent on disease or injury of the spine, the catheter should be passed with the greatest care and caution, so as, on the one hand, to avoid injury to the mucous membrane, and, on the other, completely to empty the bladder.

These are points of the greatest importance, which, perhaps, have not always been sufficiently attended to in practice. Dr. Burne mentions, in the paper already quoted, a case in which, so long as the bladder was completely evacuated, the urine retained its natural character, and the bladder remained from disease.

To prevent any injury to the mucous membrane, a gum elastic catheter had better be used; and, at the time of passing it, pressure on the pubes should not be used, nor should I advise the catheter to be kept in the bladder, but it should be introduced on each occasion when the urine requires to be drawn off. Cases are on record where abscesses in the bladder and ulcerative perforations have been the result of the point of the catheter coming in contact with the bladder.

I need scarcely observe, that if, from any circumstance, as impermeable obstruction of the urethra, or enlargement of the prostate, the catheter can not be introduced, the life of the patient must not be endangered by delay; but the bladder must be punctured.[1]

The constitutional treatment in paralysis of the bladder, depends on the cause and the affection with which it is connected. In cases of disease or injury of the spine, of affection of the brain, and of general debility, the treatment required will of course vary.

A state of bladder occurs in hysterical females, nearly resembling paralysis; but it requires local treatment different to that which is adopted in other cases of retention. If left to themselves, these cases usually recover; but if we once begin to pass the catheter, its use will be for a long time required, and the complaint protracted. I recollect distinctly a case of this kind, where the catheter was, once or twice a day, introduced for some time, until at last an opinion was raised that the malady was either feigned or nervous, and that it would be desirable not to introduce the catheter.

[1] Vide Chap. iv. on the Subacute Inflammation of the Mucous Membrane, for the remedies best adapted to check the secretion of the mucus.

The young woman after this escaped from my notice, but I learnt that the affection of the bladder soon subsided. As a general rule in these cases, the catheter ought not to be introduced.

CHAPTER III.

ACUTE INFLAMMATION OF THE MUCOUS MEMBRANE OF THE BLADDER.

The symptoms of this complaint are, frequent desire to void the urine, accompanied with shooting throbbing pains in the region of the bladder, extending towards the urethra, and these are increased by pressure on the part, or any motion of the body. There is a sense of heat, or burning, along the urethra, and a dull pain just above the pubes; the desire to make water is urgent; and the pain which is felt in passing a few drops, is often compared by the patient to the passing of melted lead. It subsides after the urine has ceased to flow, but returns as soon as a little urine accumulates in the bladder. The pain is not only felt along the whole course of the urethra, but is referred to the lower part of the abdomen, immediately above the pubes, and shoots into the perinæum and down the thighs. The urine is generally acid, and varies in appearance, being sometimes of a lemon colour, at other times of a deep red; and on examining it in a transparent vessel, by the light, numerous shreds of lymph, or mucus, will be seen floating in it. At the commencement, the urine is not albuminous, but it usually becomes so in the progress of this, and, indeed, of the other inflammatory affections of the bladder. It is discharged in very small quantities, although the aggregate amount in twenty-four hours may equal the usual quantity. Sometimes there is sickness and uneasiness in the loins, which usually indicate that the kidneys are affected. The pulse is quick and small; the tongue white; the patient is thirsty; the countenance is anxious; the skin is dry, and often affected with some scaly eruption; the limbs are painful, with uneasiness and anxiety, augmented by the absence of rest, and by the constant desire to make water.

If the desire be not arrested in the early stage, ulceration of the mucous membrane occurs, and usually proceeds till the whole of the mucous membrane is destroyed. It is difficult to determine the existence of ulceration (except in cases where the fæces are passed by the urethra), and perhaps it cannot be certainly known during the lifetime of the patient; but there is always reason to suspect it when the disease of that organ has been of long continuance, when the pain is increasing and extensive, and when pus is distinctly detected in the urine. The ulcerative process is attended with constant pain and irritation, keeping up the desire to

void the urine, which is never suffered to accumulate; at the same time, increased difficulty and increased pain generally attend the passing of it.

Ulceration may extend so deep into the substance of the bladder as to cause perforation of its parietes; and cases are recorded of extravasation of urine taking place into the abdomen from this cause. In these cases, life is soon destroyed by the extension of peritoneal and cellular inflammation. But it usually happens, when the ulcerative process extends to the other tunics of the bladder, that it is accompanied by the effusion of lymph exterior to the ulcer, which thus glues the neighbouring parts together, and prevents the escape of the urine; and in this manner, a communication is sometimes formed between the ilium or sigmoid flexure of the colon and the fundus of the bladder, or between the rectum and the under surface of the bladder, in the former of which cases, the fæces pass into the bladder, and through the urethra; in the latter, the urine goes into the rectum, and is voided with the fæces.

Mr. Wilson[1] says, "I have preserved the bladder and ilium of a person, which had adhered fifteen years before the death of the patient. Ulceration to a large extent had taken place through this connected part; and for the whole of the above period, the fæces readily passed from the ilium into the bladder. The patient died when sixty-eight years of age. Being a female, the shortness of the urethra allowed the substances which passed into the bladder a tolerably free escape, and no calculus formed."

I attended, with Mr. Garrod, of Hackney, two years ago, a lady, in whom some fæces passed through the bladder and urethra, and who is still alive.

In a case which I visited with Mr. Rance, of the City Road, in 1831, and which terminated fatally, there was a communication between the fundus of the bladder and the colon, just above a stricture, which existed in the sigmoid flexure.

I am indebted to Mr. Rance for the following account of the case:—

CASE.

About the latter end of June, 1831, I was called to visit Mr. Henry Cooper. He complained of a deep-seated dull pain in the lower part of the abdomen, extending from the pubes to the sacro-iliac symphisis of the left side; he said that he had been affected with pain in the bowels for nearly twelve months; he complained of considerable uneasiness in the urethra, and a burning sensation towards the extremity of the penis. The urine was high coloured. On pressing the hypogastric region with firmness, he suffered considerable uneasiness; his tongue was dry, a little furred, and of a brownish hue; his pulse was quick, about 110, and rather firm. I bled him to the amount of about eight ounces; ordered a dozen

[1] Lectures on the Urinary Organs, p. 317.

leeches to the perinæum, and a blister to the lower part of the abdomen; and administered a purgative. On the following day, the pulse was softer, and the urine high coloured, with a very considerable deposit of a purulent kind, and the smell very fetid. I ordered liquor potassæ and extract of hyosciamus. On the following day, I found the urine contained a considerable quantity of feculent matter, which led me to conclude that there must be an ulceration of the intestines. Flatus was also passed through the urethra; stools voided per anum, were always loose; and he said that he had not passed a solid stool for a very considerable time. On examination per rectum, the finger could not reach any ulceration or stricture; no urine ever passed per rectum. The pain and uneasiness increased; and I confined myself, in the treatment, to the sedatives, and administered various forms of opium. The strength gradually decreased, and he sank in the latter end of August. I obtained permission to inspect the body, and found that a stricture had taken place in the sigmoid flexure of the colon; above the stricture, slight adhesion existed with the fundus of the bladder, towards the left side. There was a small opening through the stricture, about the size of a goose quill, through which the fæces passed into the rectum. From the narrowness of this passage, it was impossible that any solid fæces could pass. The portion of the intestines, for about two inches above the stricture, and part of the fundus of the bladder, appeared gangrenous, and in a state approaching to sloughing; the coats of the bladder were thickened, and the bladder itself was about the size of a large orange; and, from being so much thickened, it appeared incapable of further distension.

The more usual course of the disease is, that ulceration gradually extends to the whole of the membrane, which is destroyed, and then the muscular structure is shown better than any dissection can represent it. In the progress of the ulceration, disease commonly manifests itself in one of the kidneys; and, as far as my observation goes, usually in the left kidney. This is indicated by pain in the loins on pressure (for the pain is never very severe), by shiverings, sickness, and the albuminous state of the urine. At this stage, large quantities of pus are voided with the urine, and the urine is tinged with blood.

Attempts have been made to determine, by the qualities of the pus, whether it has been secreted from the bladder, or has passed from the kidney.

"When nearly pure," says Dr. Prout, "and unaccompanied by mucus, or when it contains blood, it may be supposed in general to be derived from an abscess. Most frequently, however, it is accompanied by mucus; indeed, mucus and pus are so nearly related as to run into each other imperceptibly; and when the mucus is in excess, and has preceded the pus, we may almost always conclude that some portion of the mucous membrane lining the urinary organs is the common source of both." I may observe, that when pus and mucus exist in small quantities in the urine, it is difficult

to distinguish one from the other. Pus, however, when well marked, may be distinguished from mucus by being composed of particles. Hence, when diffused through a fluid, the latter is rendered opaque, though, upon standing, the pus subsides to the bottom of the vessel, in a state more or less pulverulent, and the fluid assumes its transparent character, but it also mixes more readily with the urine. If in urine pus be present with mucus, it is found lying on the latter, and presents a much yellower tint; it is also quite opaque; whereas mucus is more or less transparent.

As to the morbid appearances, it is known that the inner membrane of the bladder is very seldom tinged with blood on its inner surface, in a natural state; but when it is inflamed, it appears covered with a multitude of delicate blood-vessels, which are sometimes intermingled with little spots of extravasated blood.

The inflammation of the inner membrane of the bladder extends itself either over the whole bladder, or else is limited to some particular part of it; most commonly that part which adjoins the neck of the bladder is found in a state of inflammation. The inner membrane is sometimes covered with coagulable lymph; this adventitious substance has been found projecting into the cavity of the bladder; and portions of it, during life, have been occasionally separated.

In Dr. Baillie's plate of ulceration of the mucous surface, the ulceration commenced from the fundus, and proceeded towards the neck. In a specimen which I have, where part of the membrane is only destroyed, it commenced at the neck.

If the inflammation has reached a high degree, the muscular structure is also attacked, presenting here and there gangrenous spots, or being completely destroyed by it. But, as the latter adheres but loosely to the inner membrane of the bladder, the inflammation does not easily pass from one to the other. One of the kidneys will usually be found in a state of ulceration, containing pus, and the ureter inflamed in its whole course, and at its vesical extremity ulcerated. In most of the cases which I have dissected, the whole of the membrane has been removed by ulceration. But sometimes round ulcerated spots, of the size of a sixpence, are found in different parts, with the elevated edges and a red surface, the muscular structure not being seen, and the remaining membrane being very vascular. The ulcers, when small, are not unlike primary syphilitic sores, by their excavated surfaces and raised margins.[1]

This affection may be confounded with inflammation of the muscular structure, but in the latter case there is not the power of passing the urine, and the desire to void it is less frequent, not being experienced until a good deal of urine is accumulated in the bladder, and then coming on in violent paroxysms. Neither is there the burning sensation along the urethra which is felt when the mucous membrane is affected.

[1] Cyclopædia of Practical Medicine, vol. i. article *Cystitis*, by Dr. Cumin.

This disease is very likely also to be mistaken for stone. The uneasiness in the bladder, the frequent desire to make water, and the passage of blood with the urine, are symptoms of stone as well as of this complaint. But in stone, the pain is principally experienced after the bladder has been emptied, whereas, in acute inflammation of the mucous membrane of the bladder, the pain is most intense when the bladder contains urine, and subsides when it is empty; in stone, larger quantities of blood are passed than in this disease, and the urethra is seldom so irritable.

If the disease of the bladder coexist, or be connected with organic mischief in the kidney, or any other organ, little or no good will be derived from medical treatment. But as I am speaking of idiopathic inflammation of the mucous membrane of the bladder, I will pass over cases occurring from such causes.

Blood should be taken at the commencement, by the application of leeches to the hypogastric region, and they should be repeated so long as the severity of the pain continues, and the strength of the patient will allow. Commonly, however, the loss of much blood cannot be borne. The most valuable remedy at the early stage is morphium or opium, (I prefer the former,) given in sufficient doses to allay the pain about the bladder and along the urethra, as well as the frequent desire to pass the urine. These are the most distressing of the whole class of symptoms; and if unmitigated, they soon wear out and exhaust the strength of the patient; but if only a few hours' intermission be obtained in the day, some chance may exist for the recovery of the patient.

In addition to the internal use of opium, or morphium, anodyne injections, or suppositories, should be exhibited at bed-time, and great relief will be experienced from their use. Some practitioners recommend the injection of oil and opium, and other remedies, into the bladder, by means of a gum elastic catheter; and in one of my patients this plan had been tried at the suggestion of an eminent physician, prior to the patient being placed under my care, but no benefit was derived from this treatment. In fact, the pain and irritation which are experienced from the introduction of any instrument along the urethra are so severe, as to deter me from employing this plan; and unless there be retention of urine, which is very rare in this form of disease, the use of the catheter, sounds, and bougies, should be particularly avoided.

It will be advantageous to employ counter irritation above the pubes; and the hip bath at night will be found very serviceable.

In the treatment of these cases, however, we find that no remedy, opium or morphium perhaps excepted, long retains any influence over this complaint. The practitioner must be armed with a variety of agents, so as to be able to substitute one for another, when it loses its effect. An infusion of diosma, in the proportion of an ounce to a pint of water, the decoction of wild carrot seeds and parsley breakstone, small doses of copaiba and essential oil of cubebs, infusion of hops and the alkalies, will, all in their turn, be found useful.

Mercury is not of use in this form of inflammation, excepting at its commencement.

The greatest attention should be paid to the diet of the patient. Animal food, wine, spirits, and acid drinks, should be interdicted; the diet should be light, consisting of bland, farinaceous food; and the drink, of water, toast and water, and linseed tea; but not to such an extent as to increase, in any very considerable degree, the secretion of urine. The patient should also be kept as quiet as possible, and in rather a warm temperature.

The prognosis of these cases is very unfavourable, if the ulcerative stage once set in, and this is usually indicated by the continuance of the pain of the bladder on motion, and in making water. If, therefore, the pain be not subdued early, little hope can be indulged of a successful termination to the case. By judicious management, life may be prolonged for some time, but the patients are seldom cured. Having witnessed several cases of this kind, most of which terminated fatally, I fear that the complaint is irremediable, if ulceration to any great extent exists; all we can then do is, by opium and other narcotics, administered internally, to endeavour to lessen the irritation and pain.

If a female, (and females are more subject to this complaint than males,) whilst labouring under the disease, happens to become pregnant, the occurrence of this state mitigates very much the symptoms, and averts for a time the fatal determination. In 1827, I examined the body of a French woman, who immediately after her delivery was attacked with all the symptoms I have mentioned above, and died within a week from the attack. On examination, the whole inner membrane of the bladder was found completely destroyed. I could not obtain any accurate account of the case; but I learnt that the patient, for the few days she was in the hospital prior to her delivery, did not complain of the affection of her bladder. One case, however, I watched from the commencement of the disease (which occurred a month after marriage) to the death of the patient, which took place a month after delivery; and during the latter half of her pregnancy, her symptoms were much milder than before, but soon after the child was born, they returned with their accustomed severity, and destroyed the person.

CASE—DESTRUCTION OF THE MUCOUS COAT OF THE BLADDER.

I was requested, on the 17th of May, 1834, to visit Mrs. M., æt. 36, who was supposed to be labouring under symptoms of stone. She had frequent desire to make water, attended by darting shooting pains in the region of the bladder, which were much increased by walking, or exercise of any kind. The urine itself was acid, and contained some shreds of lymph or mucus. No blood or gravel had ever been passed. I sounded the patient, and the instant the instrument was introduced into the urethra, the pain experienced was most intense, and this continued during the whole of the examination. No stone could be felt. The pulse was

small and quick, skin dry and rough, tongue white, countenance anxious, and indicative of much suffering. I expressed from the first a very unfavourable opinion of the case, believing, as I stated, there was ulceration of the bladder. She had been in this state for two months, and various remedies had been tried. I suggested the use of the pareira brava, first in the form of an infusion, then of decoction. For the first six weeks, leeches were occasionally applied to the hypogastric region, and tartar emetic ointment rubbed in, and at night, a thin starch injection, with twenty minims of Battley's sedative solution, was given. After this time, Mrs. M. simply tried the decoction of pareira brava, till about two months prior to her decease, when, perceiving more mucus in the urine than usual, and occasionally blood, I added a very small quantity of balsam of copaiba to the mixture (two drams to eight ounces of the decoction, with some mucilage). This brought on sickness, and deranged the stomach so much, that she was obliged, from this time, to desist from taking the decoction. She now had sickness and nausea; pus was voided with the urine; there was complete loss of strength, emaciation of the body, hectic flushes, and on the 24th of November, death put an end to her sufferings. It should be observed that, for a few days prior to her death, no pus had been voided with the urine, and the pain and frequent desire to make water, for the only time during her long illness, almost left her.

The body was examined within forty-eight hours after death, by Mr. Merriman, jun., of Kensington, and myself. The bladder was not thickened or contracted, but so completely divested of its mucous membrane, that not a single vestige of this coat could be seen. No dissection could represent the arrangement of the muscular structure so well as it was seen in this case. One spot, of the size of a shilling, towards the fundus, was black, and almost gangrenous. The ulceration had not extended to the urethra, but its lining membrane was highly inflamed. The right kidney was natural, but there was ulceration of the left, and its interior was filled with pus. The renal extremity of the left ureter was blocked up by a detached portion of the substance of the kidney.

CASE OF ULCERATION OF THE BLADDER, URETER, AND KIDNEY.

Deborah Mulloday, aged 46, was admitted under my care at the General Dispensary, for an affection of the bladder. She complained of great uneasiness, and sometimes pain, in the lower part of the belly, and frequent desire to void urine. After the bladder was emptied, the pain and uneasiness usually subsided. These symptoms were at first relieved by the use of the decoction of the pareira brava; the pain was at times very acute; the desire to make water became more frequent; the urine contained a good deal of pus; and on two or three occasions it was tinged with blood. The pulse was small and quick; the countenance pale and sallow; and there was emaciation of the body, with occasional shiverings and cramps. She had no pains in the loins; and there

was no sickness until about ten days prior to her death, when it was very distressing, and continued for some days. On Friday, July 26, she was seized with paralysis, and she expired on the following Tuesday.

The body was examined twenty-four hours after death. The mucous membrane of the bladder was ulcerated in several spots, but was not so much destroyed as in the preceding case. The bladder was thickened and contracted, and contained a good deal of pus. The vesical extremity of the left ureter was ulcerated; the pelvis of the left kidney was full of pus; and the substance of the left kidney in some parts completely destroyed by ulceration. The right kidney was in a state of atrophy, and its interior contained a deposition of chalky matter. The urethra was inflamed, but not ulcerated.

CASES OF ACUTE INFLAMMATION OF THE MUCOUS COAT, WITHOUT ULCERATION.

I. Mary Boyer, aged 17, of a good constitution, applied to me, October 26, 1833, for an affection of the bladder. She said that about six years ago, three years before the catamenia appeared, she felt a frequent desire and uneasiness in making water, accompanied with darting pain in the passage. These symptoms had continued, but latterly had been very much aggravated. The desire to make water came on every half hour, attended with great pain, which went off on the bladder being emptied. There was pain within the labia, and sickness. The urine was very acid, containing a good deal of albumen. The countenance was pale and anxious. The alkalies, the decoction of the pareira brava, the infusion of diosma, were tried in succession, and for a long time, without any relief. Great pains were taken by the parents to second my efforts, by attending to the diet, and keeping the patient as quiet as possible, and in a warm temperature; but for several months, little or no benefit was derived. During the whole of the time, the morphium was used, the dose being occasionally increased. At last, however, the pain began to subside, and from that time a favourable change occurred in her state. Her appetite and strength returned; the urine was less acid, and not tinged with blood; but the frequent desire to pass it still remained. She married a short time ago; and, with the exception of the frequent desire to make water, is now quite well.

II. John Leburn, aged 40, cook, applied to me, 17th March, 1834, for an affection of his bladder. He said that about four or five years ago he first felt a frequent desire to make water, particularly after drinking, or exertion, and that this symptom had increased within the last twelve months, to so great a degree, as to occasion him to void the urine almost every half hour, and the desire to make water was attended with a burning sensation in the passage. There was pain in the loins, particularly in the region of the left kidney, on pressure, a tickling sensation in the course of the left

ureter, uneasiness in the left testicle, pain at the glans penis, and occasionally sickness of a morning. The urine was acid, and contained a considerable quantity of albumen. His appetite was good, and his strength was not much impaired, but he has lost a good deal of flesh. There was no stricture or stone. The same treatment was pursued in this case as in the former; but for more than ten months he experienced no benefit. At that time he began to improve; and he is now pretty well, though he is not able to dispense with the morphium at night. In this case, the left kidney was no doubt considerably affected as well as the bladder.

III. Mrs. R., æt. 28, residing in Aldersgate street, of a delicate constitution, and born of gouty and rheumatic parents, consulted me in January, 1835, for an affection of the bladder. She said that soon after her first confinement, which took place in October, 1834, she could not pass her urine, on which account it became necessary to use the catheter; this was done eight or nine times, and the operation was attended with great pain and difficulty. From this period, a frequent desire to pass her water came on, which was accompanied with considerable suffering; this, however, subsided on the bladder being emptied. The urine was acid and albuminous, and contained some fine shreds of lymph. There was pain in the left kidney and over the region of the bladder, which was increased by pressure and motion of the body. There was pain in all the limbs, and down the inside of the thighs. The pulse was quick and small; the tongue very red; the countenance pale and anxious; the bowels costive. There was a great deal of leucorrhœal discharge. I ordered morphium, together with the infusion of diosma, and the lavement to be used when the state of the bowels required it. I should observe that, previous to my seeing this patient, a variety of remedies had been tried, but most benefit had been derived from small doses of copaiba, in conjunction with carbonate of magnesia, made into the form of pills. A month elapsed before any material amendment took place. As soon as the pain in making water had subsided, I gave the acetous extract of colchicum at bed-time, the alkalies after meals, and the decoction of pareira brava internally. To my great surprise, this lady recovered so as to be able to take a journey of some distance, and is now well.

CHAPTER IV.

SUBACUTE INFLAMMATION OF THE MUCOUS MEMBRANE OF THE BLADDER.

Men are more subject to this complaint than females, and elderly persons than young ones. In some countries the disease is so uncommon, that Hoffman calls it *morbus rarissimus*. In others, it

appears more frequently, and something like it has been known to assume an epidemic character.

The discharge of mucus is the characteristic feature of the complaint; and hence the term *vesical catarrh*. This is accompanied by a sensation of heat in the bladder, extending along the urethra, weight in the perinæum, shooting pains towards the anus, and a frequent desire to void the urine, although not to so great a degree as in the acute form.

Sometimes the symptoms are very mild, and cause but little inconvenience; at other times, the disease assumes a serious character and even proves fatal, particularly in old and weak persons. Then the heat in the bladder and urethra are converted to a scalding; and the desire to make water becomes more frequent, is attended with violent straining efforts to void it, and retention often takes place, being usually caused by clots of mucus blocking up the passage. On the urine being drawn off, the symptoms are relieved for a time, but return on the filling of the bladder.

The patient is very restless and uneasy; there is great thirst; the bowels are irregular, generally very costive or relaxed; there is pain round the anus and in the region of the loins; great prostration of strength and wasting of flesh; and the patient at last dies completely exhausted.

The quantity of mucus secreted[1] varies: sometimes it is small; at other times it is considerable; and instances are recorded, where several pounds were passed in the twenty-four hours.

Small quantities of the mucus thus coming away, render the urine muddy, pale, and flaky, and afterwards settles to the bottom of the vessel.

The mucus,[2] however, is sometimes like panada, and on being shaken, colours the urine without flakes, and at other times it is stringy and flaky, and of a lumpy nature. It has been seen so glutinous, that on pouring it out of one vessel into another, it drew itself out above a foot in length without rending. Sometimes it is transparent, white, yellow, green, with streaks of blue, often without smell; sometimes, on the contrary, dreadfully fetid.

When the properties of the mucus are but little changed, it diffuses itself throughout the urine for a time, and renders the urine turbid, and of a whitish colour, but afterwards subsides to the bottom, and leaves the urine to assume its usual colour. But it is commonly thick, viscid and ropy, and sinks to the bottom of the vessel at once: in this case the urine is of a dark brown colour, and is either neutral

[1] Mucus always exists in healthy urine in minute quantities; and it may be procured by throwing the urine on a filter immediately after being evacuated, when it may be collected in transparent colourless flocculi, which if allowed to dry on the filter, possess a shining appearance.

Mucus is not coagulated by boiling, which sufficiently distinguishes it from albuminous matter. It is soluble in the acetic and nitric acids; but sulphuric acid does not dissolve it. It is soluble in caustic potass. *Vide Rees on the Blood and Urine.*

[2] Vid. Soemmering über die Krankheiten der Harnblase, &c.

or alkalescent. The urine, however, is usually acid at the commencement, and continues so until the quantity of mucus secreted is great: in this case especially, if the patients are very feeble, the urine is alkaline or neutral.

If this mucus comes away in large quantities, and is glutinous, it requires an effort to discharge it, and often occasions retention. After the voiding of it, the burning sensation in the region of the bladder ceases, but gradually returns as the mucus again collects.

In slight cases, the mucous membrane is inflamed, and presents here and there red spots, as if blood had been effused beneath the surface, while some are seen of a darker colour, almost amounting to black. Sometimes it is abraded, particularly around the darkest patches; and, in some rare cases, it has been entirely removed so as to leave the muscular fibres exposed.

If the secretion be copious, the patient becomes hectic, and at last sinks from exhaustion.

In the severe form of the disease, the whole of the muscular fibres of the bladder are much enlarged, thickened, and occasionally covered here and there with calcareous deposits. I have in my possession, the bladder taken from a man who had long suffered from vesical catarrh, presenting this appearance. In some cases of stone, an abscess is formed in the thickened coats of the bladder, and the mucous membrane is found in a gangrenous state. The kidneys, too, generally suffer: either they are simply inflamed, with the infundibula and pelvis much enlarged, or they are in a state of ulceration. The ureters are also inflamed.

The exciting causes of the catarrh of bladder are, stone, enlargement of the prostate, exposure to cold, indulgence in ardent spirits, diuretic and irritating remedies, such as cantharides, violent exercise on horseback, venereal excesses; and it exists in connection with hemorrhoids, and other diseases of the rectum. In some of the injuries and diseases of the spine, this state of the bladder frequently occurs.

Soemmering lays great stress on suppressed gout as the cause of the complaint; and Dr. Prout says, "Most frequently it attacks the gouty; and the worst case I ever witnessed occurred in a gentleman, who, for many years, had been a martyr to gout, and in whom it succeeded to an acute seizure in the bladder, that took place during an attack of that affection." There are some habits apparently more predisposed to this affection than others; such are those of an irritable scrofulous temperament, with fair skin, and tendency to cutaneous affections, more especially if they have been accustomed to live freely, or been given to venereal excesses, or have suffered from venereal affections, or gout. In such individuals exposure to cold seems one of the most frequent causes of this affection, and those who actually labour under it are generally found to suffer much more severely in cold weather.

Cases of a milder character have been observed to terminate in a short time, or to assume an intermittent form, especially when

associated with hemorrhoids, or certain petechial affections. Old persons mostly retain the complaint as long as they live.

If there be stone in the bladder, all efforts at cure, till the stone be destroyed or removed, will be ineffectual. The severity of the symptoms will depend on the composition and size of the stone, and the constitution of the patient; and, if an operation be not consented to, these circumstances must guide the surgeon in the selection of the palliatives he may employ.

The use of the catheter, even if there be no retention, must occasionally be resorted to; but in severe cases, retention generally exists, and the water should be drawn off twice in the twenty-four hours.

Injecting the bladder in particular states of this disease will be highly serviceable. Sir B. Brodie says, "that in aggravated cases of the disease, where the symptoms are at their greatest height, the mildest injections, even those of tepid water, will do harm rather than good. They are especially to be avoided when the mucus deposited by the urine is highly tinged with blood. When, however, the symptoms have in some degree abated, the injection of tepid water, or decoction of poppies, is in many instances productive of excellent effects. An elastic gum catheter may be introduced into the bladder, and the injection may be made by means of a small elastic gum syringe. The liquid should be allowed to remain in the bladder about thirty or forty seconds, and not more than an ounce and a half or two ounces should be injected each time. If the bladder be distended, so as to occasion any considerable degree of pain, the effect is always injurious instead of being beneficial. This operation may be repeated according to circumstances, once or twice in twenty-four hours. When there is a further abatement of the symptoms, the disease having assumed a still more chronic form, and the mucus being free, except on extraordinary occasions, from all admixture of blood, we may venture to add to the injection a very small quantity of nitric acid. At first, the proportion ought not to be more than that of one minim of the concentrated, or ten minims of the diluted nitric acid, to two ounces of distilled water; but afterwards this proportion may be doubled."

The tenacious mucus, which belongs to this state of the bladder, deposits phosphate of lime; and when phosphate of lime from this source co-exists, as often happens, with the triple phosphate in the urine, a combined salt is formed, and in these cases a weak solution of nitric acid (beginning with a drop, gradually increased to two of concentrated nitric acid to two ounces of distilled water) injected into the bladder, acts as a salutary astringent.

The medicines which will be found most serviceable when there is much secretion of mucus, are the decoction of the uva ursi, with the muriated tincture of iron, and small doses of powdered galls and nitre. The decoction of the pareira brava is an excellent medicine, if there be much pain and irritability of the bladder; and it may be combined with the nitric acid to lessen the secretion of mucus. If there be much pain and restlessness, morphium or

opium ought on no account to be omitted to be given. Barthez mentions a case where fifteen pounds of mucus were passed in thirty-six hours, and was cured solely by the exhibition of large doses of opium internally, and in the form of clysters.

If there be any tendency to gout in the constitution, colchicum should be administered; the form in which I am in the habit of giving it, is the acetous extract of colchicum in the dose of one or two grains at bed time. Small doses of copaiba, or the essential oil of cubebs, with hyoscyamus, will often do great good in these cases, and may be added to the decoction of the pareira brava, or given alone. But both cubebs and copaiva must be administered with considerable care, for chronic inflammation of the bladder sometimes comes on after the long continued use of these medicines. I need not say that blood-letting is never required in this complaint. In the severer form, where there is great depression of the vital powers, the patient should be sustained with light nourishment, and small quantities of wine from time to time. In the milder form, the patients may be allowed to take animal food; but beer, wine, and spirits must be strictly prohibited. The patients must also be cautioned against exposure to cold, and irregularities of every kind, and told the consequence of neglecting the advice given them. From want of care on the patient's part, the mild has often assumed the severe form, and an attack of acute inflammation has come on, and destroyed life.

CASE.

In December, 1833, I attended with Mr. Holmes, of the Kingsland Road, Mr. T., æt. 80, who, for some time past, had been subject to occasional difficulty in passing his urine, and to the discharge of mucus, which latterly had very much increased. When I saw him, there was a frequent desire to pass urine, attended with great pain and uneasiness in the lower part of the abdomen, sense of burning in the urethra, and inability to pass it, cramps in the legs, thirst, and slight shivering. On drawing off the water, these symptoms subsided for a time, but invariably returned on the filling of the bladder. The urine was acid, of a dark brown colour, and contained a great quantity of mucus more of an amber colour than any other. This always subsided to the bottom of the vessel, was very tenacious on being everted, and could be drawn into long ropes. Sometimes the mucus would come out in clots, and was occasionally very offensive to the smell, and streaked with blood. On exposing some of the mucus to the action of cold for a few hours, it became quite dense. Morphium, the decoction of the uva ursi, with the ammoniated tincture of iron, the decoction of the pareira brava, lavements, and the regular introduction of the catheter, were employed, but without any avail; his strength gradually declined; and the patient sank at the end of six weeks. There was no post mortem examination.

CASE.

The following interesting case occurred in the practice of my friend, Dr. Elliotson.

The individual had laboured under cystorrhœa, as it is sometimes called, or a discharge of mucus from the urinary bladder, for a great number of years. A large quantity of mucus was constantly deposited in the vessel which he used; and that it was the true mucus was evident, from its capability of being drawn out into long threads. He went on in this way for a number of years, and various remedies were used, but they were all rendered useless, I am quite satisfied, from his not listening to good advice, but taking an excessive degree of exercise. Any remedy, however, that was at all irritating, did him a great deal of harm: mild means only were suited to him. I am not sure that even these did him any good; but at any rate they did him no harm. The consequence of thus not taking care of himself, and taking considerable exercise, was, that what at first was a mere excessive secretion of the bladder, became at last organic disease of the organ, slow inflammation, hypertrophy, and finally, pretty active inflammation.

"Here," says Dr. E. "is the bladder amazingly thickened: its substance seems in a high state of hypertrophy. You see that the muscular fibres are considerably increased, and that canals have been formed. Here is the verumontanum; here the prostate; and here a very considerable hypertrophy of the muscular coat, mucous membrane, &c., at the part corresponding with the trigone vesicale; so that a large tranverse fold and pouch are formed by it. This person had from three hundred to four hundred small stones in the gall bladder, but he never suffered any inconvenience from them, and their presence was unexpected: you will rarely see an urinary bladder thicker than this. He had no stone, no stricture, no difficulty in passing water, but an excessive gleet, if I may say so, from the interior of the bladder for many years. We could almost fancy, from its rugousness, that the interior of the bladder was the interior of the stomach. The symptoms at last were great pain, extreme agony indeed, a constant desire to make water, a discharge of blood as well as of mucus, which at last was rather pus than mucus. From excessive secretion, there came on chronic inflammation of the substance of the bladder; and at last that chronic inflammation became acute, and destroyed the patient."

CHAPTER V.

ACUTE INFLAMMATION OF THE MUSCULAR STRUCTURE OF THE BLADDER.

Some authors conceive that the muscular structure of the bladder is never inflamed alone, but that the peritoneal and mucous membrane partake at the same time of the inflammatory action. Mr. Howship[1] says, "an acute inflammatory action of the bladder is, I believe, never confined entirely to the muscular coat. Either the mucous membrane within, or the peritoneal covering without, or both, have been always, as far as I have seen, more or less involved in the same state, and consequently the phenomena of irritation become blended with the symptoms of inflammation." Boyer, on the other hand, says, "Inflammation of the bladder, like that of all organs, composed of several tunics and lined by a mucous membrane, may attack all the tunics at once, or only the internal coat. The first case is termed inflammation of the bladder or cystitis, the second catarrhal inflammation, or catarrh of the bladder. At all events, it is right to observe, that, in cystitis, the mucous membrane partakes, more or less, of the inflammation; and that, in acute and very intense catarrh of the bladder, the other membranes of the viscera are also inflamed. Hence, without doubt, the difficulty in several cases of distinguishing the symptoms of inflammation of the mucous membrane, from those which belong to the inflamed state of the other membranes." Mr. Wilson, in his lectures on the urinary organs, says, "Inflammation may arise from various causes, affecting the whole of the coats; or it may arise from a cause acting only on one, and may be confined to that single coat." And in this opinion I entirely concur.

With the exception of those inflammations of the bladder, which are caused either by stone or the operation of lithotomy, or else proceed from outward violence or wounds, idiopathic acute inflammation of the muscular membrane of the bladder, is, I admit, comparatively rare; whilst, on the contrary, affections of the mucous membrane of the bladder, and even chronic affections of the muscular tissue, are more frequently met with. Hence we find, that there are few cases of it noticed by the surgeons of the last century, Vogel even says, "Nulla fere fit hujus morbi a recentioribus auctoribus mentio." It more frequently attacks adults than the young or old, and strong robust persons than those who are delicate. It is, also, more common in males than females, whilst the contrary is the case in regard to the acute inflammation of the mucous membrane.

The patient first complains of a dull aching pain in the region of the bladder, which soon becomes more violent and extends itself to the neighbouring organs. This pain is increased by pressure, and is attended by a desire to pass the urine, without, however, the

[1] On the Secretion and Excretion of Urine, p. 230.

power to satisfy it. The desire is not incessant, but comes on in paroxysms, attended with pain. The urine is evacuated at first in small quantities, and the attempts to pass it cause great pain. The small quantity which escapes is of a dark colour, sometimes not unlike coffee in appearance, at other times of a deep red, and even bloody colour, and at last complete retention occurs.

There is a sense of fulness in the lower part of the abdomen, pains in the lumbar region, in the groins, and down the thighs, but there is not the burning sensation along the urethra, and in the perinæum which is found in the inflammation of the mucous membrane. The complaint is ushered in by rigors, which are soon succeeded by great constitutional disturbance. The pulse is full and hard, the thirst is great, and the skin hot, with general uneasiness and sickness. If the inflammation increases, pains are felt in the intestines, particularly in the rectum, combined with tenesmus, delirium comes on, the pulse rapidly sinks, and the patient soon dies. If the inflammation be seated, as is frequently the case, in the neck of the bladder, the urine which has entered the bladder is retained by the inflammatory action in that part, and the bladder soon becomes distended and projects above the pubes. There is a sense of weight in the perinæum, and often painful erections of the penis, and an examination by the rectum gives great pain.

The anatomical arrangement of this part easily accounts for these symptoms. The triangular space is at once very vascular and highly sensitive: its nerves arising from the third and fourth sacral pairs, as well as from the great sympathetic, descend on each side through the inferior mesenteric and the hypogastric plexus, and communicate more particularly on this space. When irritated, therefore, it gives rise to the desire to evacuate the bladder, and to great pain in states of disease.[1]

If the inflammation is situated somewhat higher up in the bladder, where the ureters enter, the orifices of the latter will be contracted, and the ureters themselves enormously enlarged. If the inflammation extends to both the orifices of the ureters, the bladder is closed against the influx of the urine, and the ureters become enormously distended. I examined, with Mr. Camplin, the body of a young gentleman who died of this complaint, in whom the ureter was so distended, as to equal in size a portion of the small intestines.

[1] With regard to the urethral opening of the bladder, Mr. Guthrie observes, "that fibres have been described surrounding this part, though no anatomist has demonstrated them so as to warrant their being called a sphincter muscle; that this part may be both muscular and elastic, but that the older anatomists supposed the power which prevented the flow of urine to reside in other muscles surrounding the membranous part of the urethra; that he is able to show and to describe these muscles; that the fact of there being an elastic structure at the part is of great importance, because it enables us to account for the occurrence of certain diseases, in a more satisfactory manner than formerly, to take new views even of these diseases, and to adopt new modes of practice, which may be found more beneficial."—*On the Diseases of the Bladder, &c.*

The orifices of the ureters[1] are surrounded by a dense elastic substance, which lies between the muscular and the mucous coats of the bladder: beginning at the base of the triangular space, it inclines inwards as it advances towards the neck, forming in a great measure the orifice, and appearing to be continued through the urethral passage as its elastic membrane. This elastic triangular substance yields to a certain extent to the pressure of the urine, when impelled by the detrusor urinæ, and returns to its original situation when the pressure is removed.

If the inflammation is situated more in the upper part of the bladder, there is danger of its extension to the peritoneum, and pain is greater on pressure; but the desire to pass the urine is not so frequent and the difficulty less.

The progress of the complaint depends on the severity of the symptoms. Very severe cases occurring, for instance, after suppressed gout, sometimes terminate fatally within a short time of the commencement of the attack; but, in ordinary cases, after two or three days, if active measures be employed, the pain begins to subside, the water flows with greater facility, is less acid, and of a lighter colour. The febrile symptoms, and, at the same time, the local uneasiness, lessen. This form of inflammation sometimes terminates in the formation of abscesses in the coats of the bladder, and the symptoms are of a very formidable character, depending upon the size and situation of the abscess. The urgent symptoms of the inflammation subside; but there is a dull pain in the region of the bladder, occasional rigors, with febrile excitement, and uneasiness in passing the urine and the fæces. The abscess may open into the cavity of the bladder, in which case the pus is evacuated with the urine, and the patient experiences great relief; or, on the other hand, the matter may extend into the cellular tissue of the pelvis, and make its way either through the rectum, or to the perinæum, or even to the groins, in which cases the result is most frequently fatal. Mr. Wilson mentions an interesting case, where extensive suppurations had taken place in the coats from the prostate to the fundus of the bladder, the matter being lodged every where between the coats, and near the fundus several ulcerations had taken place through the internal membrane, by which the matter had passed into the cavity of the bladder.

This complaint may be easily mistaken for acute inflammation of the prostate gland; the uneasiness and pain in the region of the bladder and the perinæum, the occasional but strong desire to pass urine, every effort being attended with great pain and retention, are symptoms common to both complaints. In inflammation of the prostate, however, there is more fulness and tenderness on pressure in the perinæum, and on examination, per rectum, the prostate will be found exceedingly painful and sensitive.

The morbid appearances which are found in acute inflammation of the muscular coat of the bladder, are, in recent cases, great vas-

[1] Guthrie, op. cit. p. 5.

cularity, the tunic being thoroughly injected with blood, and of a dark red colour.

Sometimes this coat will be found even to be gangrenous, and instances are recorded where it has given way, and the urine escaped into the pelvis. The mucous membrane will be also found of a dark red colour. In other cases, the membrane will be found thickened, and the bladder itself contracted. Pus is found sometimes infiltrated through the tunic, or else circumscribed in the form of an abscess.

Acute inflammation of the bladder is sometimes caused by exposure to cold, and indulgence in spirituous liquors, but more frequently it occurs in gonorrhœa, on a sudden suppression of the discharge, when the metastasis takes place to the bladder.

Amongst its causes may be also classed wounds and blows, or injuries from the incautious or violent use of instruments. The immoderate use of cantharides internally, will produce this complaint, and even in excitable persons the external application of this medicine. After an irregular or suppressed attack of gout, this affection comes on, and frequently assumes a very serious and formidable character.

CASE.

Richard Serigiter, æt. 68, watch-maker, after a slight attack of gout, was seized with rigors, which were succeeded by fever and great constitutional irritation. His pulse was extremely quick; the skin was hot and dry; and there were great thirst and sickness. He had a strong desire to pass the urine, which came on in paroxysms, but he could pass but a few drops at a time. There was pain in the region of the bladder and loins. Colchicum, and the saline aperients, were administered; leeches and warm fomentations applied to the region of the bladder; and the warm bath tried. The bladder being distended, a catheter was introduced, and between two and three pints of very dark urine was drawn off. None of these measures gave any relief: the constitutional disturbance increased, delirium came on, and the man died within forty-eight hours of the commencement of the attack. I examined the body on the day after the decease, and found the bladder in an intense state of inflammation: there was no organic change in its structure, but the tunics, particularly the muscular coat, were of a very deep and red colour. I have the preparation in my possession, and although it has been in spirit three or four years, it still retains its redness.

The symptoms of this complaint are so severe, and its progress so rapid, that prompt and decisive measures must be adopted. General blood-letting, if the patient be strong or robust, must be first employed; or, if the patient be delicate, and of a spare habit, local bleeding, as leeches to the pubes, or cupping in the perinæum, may be substituted; or these may be regarded as auxiliaries to the general blood-letting.

Hot fomentations should be constantly applied to the pubes, and the patient, after the bleeding, should be placed in a hot bath. As I have already observed in these cases, there is retention, and the urine must be from time to time drawn off by the catheter. Internally our main reliance must be placed on the use of calomel and opium, which must be given every three or four hours: this medicine affords the most speedy relief. As there is frequently tenesmus, the proportion of opium should be large, and at the same time sedative injections should be administered. After the urgency of the symptoms have subsided, the saline aperients, combined with the vin. semin. colch., will be found beneficial, especially if the attack has occurred in a gouty subject. The diet must consist of nothing but lukewarm mucilaginous drinks. If the complaint has arisen from the suppression of the discharge in gonorrhœa, it subsides on the reappearance of the discharge.

If these means be employed early, the patient soon experiences a diminution of the pain. The water is passed in greater quantities and with less suffering, his constitutional symptoms improve, and he then falls into a sound and refreshing sleep. If, on the other hand, these measures be delayed, the symptoms which have been before described become aggravated, and delirium and death ensue.

CHAPTER VI.

CHRONIC INFLAMMATION OF THE MUSCULAR COAT OF THE BLADDER.

It not unfrequently happens that, after an acute attack, the bladder never recovers its usual tone, and the chronic form of the complaint supervenes: at other times, it is an idiopathic affection, the acute form never having preceded it. The complaint is extremely distressing, and I regret to say, seldom cured.

In this affection, there is uneasiness about the region of the bladder, frequent desire to make water, both by night and day, but especially by night, and the urine does not flow so readily as it did: there is also uneasiness about the region of the bladder, and occasional prolapsus of the rectum. The patient frequently complains of pains in all the limbs and in the region of the back; the skin is dry, and attacked with psoriasis or lepra; the urine is scanty, of deep colour, and of high specific gravity. The kidneys, after a time, are involved in the progress of the disease, the urine becomes albuminous, nausea supervenes, the patient loses flesh and strength, and sinks at last from complete exhaustion.

In this case, the coats of the bladder become thick and hard, so that they no longer admit of the former degree of extension. When this is the case, the patient experiences in the pelvis a sense of weight, and the bladder may be felt through the rectum, as a hard

thick body. "The elasticity of the neck of the bladder," says Mr. Guthrie, "is impaired, it will not dilate with the ordinary action of the detrusor muscle, and this is therefore augmented. A sensibly increased delay is experienced before the water begins to flow, and the patient is conscious of the augmented effort made by the bladder; in other words, he is obliged to strain to expel it. The desire in which this originates soon amounts to uneasiness, and rapidly afterwards to pain, relieved on evacuating a little water; but too soon to return; for the bladder is now never completely emptied, and the urine which remains is a source of great irritation, although the quantity is really inconsiderable."

On dissection, the bladder will be found more or less thickened; and its inner surface presents a considerable number of rugæ, caused by the projection of the enlarged fasciculi beneath. The thickness of the bladder is sometimes very considerable. Dr. Baillie has given the representation of a bladder nearly an inch in thickness: the prostate gland is enlarged.

The muscular coat of the bladder, when called upon, or excited to repeated and forcible action, through stricture of the urethra, or prostatic enlargement, or calculus, becomes firmer, thicker, and of a darker colour: it sometimes attains a thickness exceeding half an inch. In this state it does not dilate as before, and is incapable of holding more than a few ounces of urine. In fact, as Dr. Cumin justly observes, in all prolonged diseases of the urinary bladder, when frequent ineffectual attempts are made to evacuate its contents, the muscular coat acquires an extraordinary increase of size and firmness, separating into distinct bundles, which project on its internal surface, and leave spaces through which the mucous membrane is forced, thus forming small pouches: this is not the consequence of inflammation, but of increased muscular action.

This disease is frequently the sequel of acute inflammation, but is also caused by strictures in the urethra, enlargement of the prostate, prostatic calculi, cold, stone, indulgence in spirituous liquors, irritating medicines, as cantharides; and in some constitutions the long-continued use of cubebs and copaiba. In persons in whom there is an hereditary predisposition to urinary affections, it occurs from slight causes, as well as in gouty and rheumatic subjects. The retention of the urine in the bladder, after the desire to void it has been felt, often brings on this complaint.

This affection is likely to be confounded with simple irritation of the bladder; but the absence of pain, and of the constitutional symptoms which I have described, is the great diagnostic sign. Hysterical females are also subject to a peculiar form of irritation of the bladder, which might be mistaken for inflammation. They suffer great pain, and even have retention of urine; but the temperament or constitution of the patient will show the nature of the disease.

When this affection is produced by stricture, or any local cause, it is clear that the primary affection should especially engage our

attention, but even when this has been removed, the inflammatory complaint of the bladder often remains. In gouty, rheumatic, or plethoric persons, colchicum given at night, in the dose of one or two grains of the acetous extract, will be found of great service; and as in these cases the urine is acid and often scanty, the alkalies should be given. I usually advise them to be given after meals, and I employ a formula, which Dr. Prout often uses, viz. the bicarbonate of potass, sesquicarbonate of soda, and nitrate of potass. In addition to these medicines great benefit will be derived from the pareira brava. Some years ago, I published some cases of this complaint, which were relieved by this remedy, and subsequent experience has quite confirmed the opinion which I then ventured to express of it. This medicine formerly had a place in the pharmacopœia; and after being omitted for a time, it is restored to the edition which has recently appeared. It was very much in repute in many parts of Europe in the beginning of the last century, and in a work published at that period by Andreas Helvetius, it is mentioned as a specific for the affections of the bladder and kidney: his observations are,—"La racine de pareira brava est un specifique contre toutes les maladies des reins et de la vessie qui sont curables. Il agit avec tant de douceur qu'il n'y a point d'occasion où l'on ne puisse l'employer sans en craindre de mauvaises suites, et on peut comparer ses effects aux specifiques du quinquina, de l'hypecacuanha," &c.—*Traité des Maladies les plus frequentes, &c., par M. Helvetius, Liege*, 1711.

The mode of preparing this medicine, as advised in the present pharmacopœia, is to put six drams of the root into a pint of water, and to macerate it for two hours. I usually, however, order a decoction—an ounce to a pint and a half of water, to be boiled to a pint.

Messrs. W. Allen & Co., of Plough Court, have recently made some experiments for me as to the advantage of macerating the root previous to the boiling.

Three decoctions of the radix pareira brava were prepared with the following differences:—

1. Without previous maceration in cold water.
2. With previous maceration of 4 hours.
3. Ditto 12 hours.

On comparison, there appear but slight variations in the results. No. 3, however, seems to possess *rather a stronger taste* than No. 1. Perhaps the same may be said (in a less degree) of No. 2.

These decoctions are filtered with difficulty; but, by long standing, the feculent matter was separated, and the supernatant portions compared together. No. 1 was perfectly bright, while Nos. 2 and 3 were not quite so; yet, contrary to expectation, No. 1 was found to be of a rather greater specific gravity. This would imply that the previous cold maceration *does extract something, not permanently to remain in solution, but to be precipitated, and with it to carry down some other matter during the subsequent boiling.* If this be the case, it indicates the impropriety of the feculent part

being separated—at least until it is ascertained to possess no medicinal efficacy.

The extract of the pareira brava is also a very good medicine, and may be given in doses of ten grains, three times a day.

The diosma, in the form of an infusion, combined with the alkalies and tincture of hyoscyamus, will be found of great service. Should the urine not be acid, or, as is not unfrequently the case, should the alkalies produce headache and restlessness, or uneasiness about the region of the stomach, then their use must be discontinued, and resource had only to sedatives, as the extract of hop and extract of uva ursi, or the nitric ether, with the tinctura camp. co.; and the occasional exhibitions of suppositories. The diet should be plain, but nutritious, and all beer, wine, and spirits, should be prohibited. Exposure to wet and cold invariably aggravate this complaint, and should, of course, be avoided.

CASE.

—— Lind, æt. 68, of a gouty and rheumatic diathesis, a regular habit, (a patient of the General Dispensary,) says, that four months ago, whilst traveling to Birmingham, he felt a desire to make water, which, from the hurry of the coach, he was unable to get an opportunity of satisfying, and the consequence was, that at the end of the journey he was seized with retention. After this, his present attack came on, viz., pain in the region of the pelvis, scalding sensation in the passage, pain round the anus, diarrhœa, loss of flesh, great thirst, chilliness, tongue dry, constant desire to make water, with occasional incontinence: he is easy when the urine is passed. Has had a great deal of sickness. The urine when first passed is turbid, and of a whitish flocculent appearance: on being allowed to remain, the urine became clear, and of a bright straw colour; and some semi-fluid matter was deposited at the bottom of the vessel. There have been occasional streaks of blood in the urine for several years: there has been a difficulty in passing his water, or rather the stream has been small, and he has been longer passing it than he used to be. On examination per anum, the prostate is enlarged. The pulse is small and weak.[1]

As the urine presented different appearances from those usually observed, I sent some to Dr. Bostock, to whose kindness I am indebted for the following analysis:—"The fluid had the appearance of thin gruel, it was nearly without colour, and had a very slight urinous odour; it contained no flakes or masses of matter, and seemed to be of an uniform consistence. After remaining at rest for twenty-four hours, a thick substance began to subside, and in about thirty-six hours the upper part was become much more clear and transparent. This was poured off, and left a quantity, amounting to about one twentieth of the whole, of a semi-fluid matter, of the consistence of thick cream, of a light greenish tinge and a nauseous odour.

[1] This patient gradually sank, and died about a month after I saw him.

The clearer portion of the fluid was still somewhat opaque; it had a light primrose colour, and a faint urinous odour; it just perceptibly reddened litmus, and it passed readily through filtering paper without any apparent change.

The thicker part of the fluid, after standing for four days, showed a little tendency to further subsidence, but, in other respects, was not changed; it was adhesive, but not viscid; and it was readily diffusible through water. When examined by the microscope, a number of globules were distinctly perceived in it; and both from its physical properties and its chemical relation, I conceived that it was composed principally of albumen, in a half coagulated state, mixed with a quantity of pus.

By exposing the clearer portion of the fluid to the temperature of boiling water, and by adding to it the appropriate chemical re-agents, it was found to contain a small quantity of albumen. When this had been separated from it, it became perfectly bright and transparent, and acquired a light yellow colour.

Both the fluid and the sediment now began to evolve ammonia. A portion of the fluid after the deposition of the thick matter was slowly evaporated, and left a residuum of 1-25 per cent.; it was evidently composed of urea, and various saline substances. By digesting it in alcohol, the urea was separated, and was found to constitute 0-61 per cent., very nearly half of the whole residuum.

The composition of the clear part of this fluid was as follows, in one thousand parts:—Water 987.5, urea 6.1, salts, albumen, &c. 6.4.

According to Berzelius the constitution of healthy urine is:—Water 930.0, urea 30.1, salts, &c. 39.9.

Hence it would appear, that this urine is of the species which I have denominated aqueous, where the urea and the salts bear to each other nearly their ordinary proportion, but are considerably deficient in their absolute quantity. In addition to these it contained a quantity of semi-purulent matter, which was mechanically diffused through it, but which did not appear to affect its chemical constitution.

CHAPTER VII.

INFLAMMATION OF THE PERITONEAL COAT OF THE BLADDER, AND OF THE SURROUNDING CELLULAR TISSUE.

On dissection, we find the abdominal or peritoneal covering inflamed, as well as the mucous and muscular coats. The peritoneal covering is sometimes inflamed, from that action spreading to it from another part of the membrane; and as it is loosely connected by cellular tissue to the muscular coat, the inflammation may not be communicated to it.

There are on record, says Dr. Todd, two cases in which acute inflammation was limited to the peritoneal tunic of the organ. Dr. Baillie suggests, as a reason for such limitation to this particular tunic, the quantity of cellular tissue interposed between the serous and muscular tunic, and the laxity of their connection.

The inflammation of the peritoneal covering is seldom confined to the bladder, but extends generally over the whole membrane. It is often the close of a fatal disease of the bladder, but that it takes place under other circumstances, without any dangerous consequences, we have sufficient evidence, from the old adhesions not unfrequently found connecting this part to the omentum, to portions of the intestine, to the uterus, or to the rectum. The pain and its aggravation on pressure, the state of the pulse, the countenance, and position of the body, clearly indicate the nature of the complaint.

The treatment adopted in general peritonitis, must be had recourse to in inflammation of the peritoneal covering of the bladder. The lancet, leeches, calomel, and opium, and warm applications to the part, must be vigorously employed. The complaint rarely, if ever, proceeds to suppuration; but coagulated lymph is sometimes thrown out on the inflamed surface, forming adhesions with some part of the peritoneum, covering other viscera, or lining the cavity of the abdomen.

The inflammation of the external covering of the bladder is, however, generally connected with the inflammation of the adjoining lining of the pelvis.

In these cases, a peculiar train of symptoms occurs, requiring a different plan of treatment from that of the peritoneal inflammation of the bladder.

"The pulse," says Brodie, "is frequent, rising to 90, 100, and at last to 140, in a minute; the heat of the skin is great; the tongue dry; the countenance anxious. There is an occasional hiccough; the patient complains of some degree of tenderness in the lower part of the abdomen; the belly becomes tympanitic; the distension of the belly increases; the hiccoughs are more frequent; the pulse intermits, becomes weak and fluttering. In some instances, the patient retains his understanding, even to the last; while in others, he falls into a state of low delirium previous to death. Occasionally, in the progress of such a case, the patient has a severe rigor, and sometimes he complains of a pain in the loins. On dissection, we find the cellular membrane round the neck of the bladder, and between the prostate and rectum, bearing marks of inflammation, infiltrated with lymph and serum, and to a greater or less extent converted into a slough. If death has taken place at an early period, the intestines are found inflated with air, and there is a very slight effusion of serum in that part of the peritoneum which descends into the pelvis. But if the patient has laboured under these symptoms for many days before he dies, the peritoneum, where it is reflected from the bladder to the rectum, is seen of a darker colour than natural, and encrusted with lymph; and, at a

still later period, there is the appearance of inflammation, to a greater or less extent, throughout the peritoneum generally. But the peritoneal inflammation is evidently not the primary disease; it is the inflammation and sloughing of the cellular membrane of the pelvis, which has induced inflammation of the adjoining portion of that membrane.

"It is important that we should not fall into the error of regarding these cases as cases of simple peritoneal inflammation, for the remedies which would be useful in the latter case are useless here. The abstraction of blood, even the operation of an active purgative, will cause the patient to sink more rapidly, tending only to hasten his death. The proper system to be pursued is the opposite of that to depletion. The patient should take such nutriment as his stomach is capable of digesting. The bowels may be kept open by injections, or by the exhibition of some very gentle purgative; and ammonia, wine, and brandy, are to be administered when the state of the general system indicates that stimulants are necessary."

The cellular tissue surrounding the bladder is sometimes the seat of chronic disease, and abscesses may form in different parts without the bladder being affected. These cases are always involved in great obscurity, and often terminate fatally.

CHAPTER VIII.

FUNGUS HÆMATODES AND CANCER OF THE BLADDER.

Fungous excrescences occasionally arise from the inner surface of the bladder, and are productive of most distressing symptoms, often very similar to many of those which attend the stone. These excrescences are different in their size, and in the extent of surface which they occupy. Sometimes they originate from a single root, and occasionally from several; but they generally consist of a similar loose and fibrous structure. In certain situations, as when immediately behind the neck of the bladder, they will, by blocking up the origin of the urethra, cause a very considerable obstruction to the passage of the urine; and the bladder being irritated, and frequently excited by them to stronger action than in a natural state, its muscular coat becomes thickened. These excrescences are sometimes attended with a discharge of blood, and of a viscid ropy mucus, the result of irritation of the inner membrane of the bladder, and with pain along the urethra, and at the glans penis. The glands in the groins and pelvis usually become enlarged.

"There is a malignant medullary fungus," says Mr. Travers,[1] "of the mucous coat of the bladder, resembling that of the nares

[1] Medico-Chirurgical Transactions, vol. xvii.

and uterus, breaking and bleeding, and reproduced as quickly as it is displaced. It is of very extensive attachment, and gradually reduces the cavity to a very small dimension. Portions of fungus, and coagula of blood, become plugged in the urethra, and form firm pellets, so as to produce retention. It is a very painful disease; keeps the patient in constant anxiety to void urine, which is more or less tinged with blood, and frequently he passes blood alone. He dies hectic and wasted."

In a case of fungus hæmatodes, which Mr. Mayo examined with the late Mr. Wilson, in which the existence of stone had been suspected, from pain in the bladder and occasional discharge of blood, a fungus was found attached by a narrow pedicle to the mucous membrane; the texture of the fungus was soft, and its surface shreddy and ragged. In a patient of the same gentleman, who died in the Middlesex Hospital, with medullary sarcoma affecting the uterus and neighbouring part of the vagina, the bladder was studded with little white tubercles, about the size of peas, which had formed behind the mucous coat, but projected inwards. They appeared, when cut through, of the same medullary texture with that which grew from the uterus and vagina.

"In these cases," says Sir B. Brodie, "the patient complains of a too frequent inclination to void his urine, and of an uneasy sensation referred to the neck of the bladder, which sometimes amounts to severe pain, extending to the perinæum, and along the urethra to the glans, and in another direction to the pubes. This pain is generally aggravated after the urine is voided. I have known the patient to labour under a retention of urine in consequence of the tumour pressing on the inner orifice of the urethra, so that it may become necessary to puncture the bladder above the pubes. In another case, there was a constant wearing pain in the loins, the cause of which was explained by the appearances observed in the post mortem examination, the tumour having obstructed the orifice of the ureters, which were in consequence dilated to the size of the small intestine, the pelvis and infundibula of the kidneys being dilated also, so as to form considerable sacs or pouches, distended with urine."

There is always a disposition to hemorrhage, and it is sometimes so great as to be the immediate cause of the patient's death. The urine also frequently contains small portions of the medullary matter.

In some cases of cancer of the rectum in men, and of the womb in females, the disease is communicated to the bladder; ulceration of this organ takes place; and a communication is established between the rectum and the bladder, and between this last and the vagina, a circumstance which renders the patient's state most deplorable. It is doubtful, however, whether the ulceration be of a true scirrhous character. Mr. Travers says, in the paper just quoted, "I never saw scirrho-cancerous ulceration of the bladder; scrofulous often, particularly in children. When the bladder adheres extensively to the rectum in the cancer of the latter, and

when they communicate by a fistulous aperture, so that air passes by the urethra as well as feculent urine, I have not seen the coats of the bladder presenting the appearance of scirrhous cancer. The vagina and rectum in the female are, on the contrary, indistinguishably affected by the scirrhous ulcer and fungus."

In these cases, all that we can do is to allay the pain and irritation by the use of sedatives, taken internally, and in the form of suppositories or injections, introduced per anum. The bleeding is sometimes so great as materially to exhaust the powers of the patient. In such cases, our endeavours must be directed to restrain the bleeding,[1] and, at the same time, to sustain the powers of life without increasing the local excitement. Astringents should be given internally, and the patient should ke kept in the horizontal position. Too much stress cannot be laid on the necessity of keeping the patient in this position; for in severe hemorrhage from the bladder, particularly in old persons, syncope has come on whilst the patient has been sitting up, or exerting himself, and death occurred. The powers of life are generally much exhausted; and the urine is often alkaline, containing albumen, and a large proportion of the phosphates.

I may, perhaps, observe here, that when albuminous urine is alkaline, it is sometimes incapable of being coagulated by heat. It was supposed that this depended on the presence of some fixed alkali, which held the albumen in solution. Mr. Rees made an analysis of two different specimens of urine taken from the same individual: one was neutral, and coagulable by heat; the other was not coagulable by heat, and possessed an alkaline reaction. From the analysis, it appeared that the alkaline specimen contained the greatest proportion of albumen, and a much smaller proportion of alkaline salts than the neutral urine. This goes strongly, he observes, against the probability of any fixed alkali being the solvent of the albumen; for in this case we should expect a redundant quantity of fixed saline matter, in proportion to the albumen present, whereas exactly the opposite was the result.

If the urine be very alkaline in these cases, the decoction of the pareira brava, with the nitric acid, will be very serviceable; on the contrary, if the urine becomes acid, the uva ursi, with the fixed or volatile alkalies, will be the most appropriate remedy.

[1] The following will be found very serviceable in these cases:—R. Infus. rosæ comp. ℥ vj.; aluminis pulv. ʒ ss.; gallarum pulv. ʒ iss.; acid. sulph. dil. ʒ i. mix. Two tablespoonfuls to be taken every four hours.

CHAPTER IX.

FOREIGN BODIES IN THE BLADDER; OPERATION FOR STONE.

Several instances of hair voided by urine, are mentioned by Sir Hans Sloane; one particularly of a brewer, who suffered from the occasional passage of long hairs, matted or woven together, passed with great pain, but with little or no calculous matter attached to them. Mr. Powell relates a case of a middle aged lady, who, after being teazed with disordered stomach and bowels, and the evacuation of whey-coloured and fetid urine, passed little masses of hair, mingled with a peculiar viscid mucous substance, partly crusted with calculous matter. The extrication of these substances was attended with aggravation of the distress and pain in the bladder, from the urine bringing them into contact with the orifice of the urethra. This complaint, which continued long, induced great weakness, and total loss of flesh. Dr. Wallace, also, met with an instance, in which hair was several times voided with the urine; and on the body, after death, being examined, a stone was found in the bladder, large as a goose egg, from parts of which hairs had grown out. It was thought that the hairs voided during life, which were a great many, and some of an extraordinary length, grew out of that stone; because when the hairs hung out of the urethra, as they frequently did, to his great torment, they were obliged to be pulled out, which was always done with a resistance, as if plucked out by the root.[1]

Musket balls have found their way into the bladder, sometimes occasioning very little inconvenience, at other times giving rise to very distressing symptoms. Larrey, Ballingall, and other writers, mention cases of this kind.

"Some time ago," says Mr. Ingleby,[2] "I was called to a woman, a female catheter having unfortunately been allowed to pass entirely into the bladder. The patient was in the fourth month of pregnancy, and had experienced a retention of urine, by no means uncommon, just before the uterus finally quits the pelvis for the abdomen, but in this instance occasioned by the womb being considerably prolapsed—a circumstance which it is material to mention. At the time I saw the patient, the catheter had been in the bladder eight hours. It lay in the centre of the organ, quite transversely; and, the urine having dribbled away, the bladder was in as contracted a state as the catheter admitted of. By means of a long and very slender pair of forceps, passed per urethram, I embraced the instrument near one end, and with the two fore-fingers of the left hand, passed by the vagina, carefully elevated the other end; and having thus brought it into the horizontal

[1] Howship, op. cit., p. 167.
[2] On Uterine Hemorrhage, p. 106.

direction, gently extracted it. As little injury as possible was inflicted upon the patient; nevertheless, the ovum was discharged on the third day, but without hemorrhage. The fœtus presented a perfectly white and beautiful appearance; the scalp excepted, under which there was a considerable extravasation of blood; and to mechanical injury (occasioned, no doubt, by the difficulty in giving the catheter the horizontal direction), its death may be directly ascribed."

Mr. Toogood, of Bridgewater, has recently published, in the Medical Gazette, two interesting cases, where the female catheter slipped into the urethra. In both cases, the instruments were extracted by dilating the urethra by the sponge tent, so as to enable the fore-finger to be introduced into the bladder. Mr. Key and myself saw, two or three years ago, a case, where three inches of a thin gum elastic catheter broke in the urethra, near to the bladder, and although we were called to the gentleman immediately after the occurrence of the accident, we could not lay hold of the broken portion. Three weeks after this, the fragments (for there were two, one an inch in length, and the other two inches) were voided by the urethra. From the fortunate termination of this case, I came to the determination always to wait, in similar cases, before recommending an operation. An interesting case has been published by Mr. Tyrrell,[1] where a patient, in whom a catheter broke in the urethra, and escaped into the bladder, came under his care. The following plan was successfully adopted for its extraction:—The patient was placed on a bed in a half sitting posture, with his thighs semiflexed; the sound which had been previously introduced, being withdrawn. Mr. Tyrrell then introduced one of Weiss's instruments for extracting small calculi, which was nearly straight, and had a strong spring. By careful examination with it, he discovered that the extremity of the foreign body towards the patient's right side was free, and that the other was covered with a fold of the bladder. After several unsuccessful attempts, he succeeded in seizing the free extremity with the instrument, and by withdrawing it very cautiously, brought the piece of catheter into the urethra, when the forceps slipped from it. Mr. T. immediately introduced his finger into the rectum, for the purpose of compressing the urethra between the foreign body and bladder, so as to prevent any retrograde movement of the former. This being secured, the forceps was again introduced into the urethra, and in the first attempt, the piece of catheter was laid hold of, and extracted.

If the foreign body be not passed by the efforts of nature, or cannot be extracted by means similar to those which were adopted in the case just described, the same operation as for stone, should the urgency of symptoms render surgical assistance necessary, must be resorted to.

Hydatids have been discharged from the urethra, and numbers

[1] Vid. St. Thomas's Hospital Reports.

of them have been found after death floating loose in the bladder. In such cases, it is most probable that they have descended from the kidney along the ureters, or that they have been introduced into it from a cyst formed in the pelvis, which had opened by ulceration into the bladder. Worms have been also discharged with the urine; an instance of which is related by Mr. Lawrence, in the Medico-Chirurgical Transactions.

The formation and symptoms of urinary calculi have been so ably treated by Marcet, Prout, Brodie, Crosse, and others, that I must refer my readers to the works of these authors, for information on this interesting subject. I will, however, insert here the following observations on the operation for stone, which were delivered by me, some time ago, in a clinical lecture; and I have, since that period, found no reason to alter the views which are here advanced. Prior to performing the operation for stone, the surgeon should be extremely particular in preparing his patient by those means which experience has shown to be best conducive to this end. Celsus was aware of the necessity of bringing the patient into a fit state for the operation, by diet and abstinence; in fact, the most successful lithotomists are those who are most attentive to this point. If the patient's health is much impaired, and the bowels are relaxed, which is not unfrequently the case in children, or if the urine is alkaline, you must, before the operation, lessen the irritability of the bladder and bowels by an anodyne, and improve, as far as you can, the patient's health, by medicine and attention to diet. I generally give, on the night preceding the operation, a few grains of hydrarg. c. creta, with the pulv. rhei, and early on the following, some castor oil. Two clysters should be given before the operation; one, two or three hours after the oil, composed of gruel, olive oil, and salt; and the other, about an hour before the operation, with common gruel and twenty or thirty drops of laudanum in it. If, when the surgeon arrives to perform the operation, the last injection has not come away, he should urge the patient, if he be an adult, to go to stool; if, however, it is a child, it will generally happen, that if the injection has not passed off, it will do so at the time the staff is introduced. On no account should the surgeon undertake the operation till the injection has come away. The patient should be placed on a table of sufficient height, so that the perinæum be opposite to the breast of the surgeon. The table should rather be a little too high than too low, for it will be an advantage to you in the operation, to be a little under your work rather than above it. After the patient is bound, his shoulders and back should be raised and supported with pillows; he should be brought to the edge of the table, and his thighs be widely separated by an assistant; but it is of great importance that the nates be kept straight, and that an inclination be not given to one side more than the other. I now introduce a curved staff, and give it to the care of an assistant. You no doubt observed, that Mr. Pereira, who held the staff for me, gave to the instrument a different direction to that in which it is usually held. Instead of

holding it perpendicularly, or nearly so, Mr. P. inclined the handle a little towards the ground, with the groove turned towards the left side. By this inclination of the handle, you certainly make the groove of the staff less prominent in the perinæum; but there is this advantage, when you have cut into the groove, you have no occasion to alter the position of the staff, and the fore-finger of your left hand is quite at your disposal for protecting the rectum, and guiding the knife. I find that I can perform the operation much more rapidly in this way, than by taking the staff into my own hand. M. Langenbeck is a strong advocate for this mode of holding the staff; he, however, advises the handle to be inclined still more towards the ground than I do. I begin the first incision rather low, about two fingers breadth above the anus; the bulb of the urethra will be then avoided. In fact, the external incision, if commenced higher up, can be of no use to you; and I find that this, the upper part of the wound, is often the slowest to heal. Respecting the remaining steps of the operation, I have little new to offer. For the division of the prostate, I use the long straight knife, with the beak in the middle line of the point. I began in 1828 with the gorget; but whatever merits this instrument may possess in the hands of an experienced operator, I feel confident that, for a beginner at least, the knife is the safest and best instrument he can employ. If any hemorrhage occur, you must endeavour to compress the bleeding vessel with your finger.

The after treatment consists, if no inflammatory symptoms ensue, in merely keeping the patient quiet, though it is extremely difficult to carry this into execution with children. The knees, by some surgeons, are tied together; by others they are not; but they should always be kept raised, and the scrotum supported. No application is required to the wound; but the urine should be received on sponges, and the parts kept clean; some urine soon begins to flow through the natural passage. In a man above sixty, on whom I operated some time ago, a considerable quantity of water came through the urethra on the morning following the operation. The time, however, varies at which the water entirely ceases to pass through the wound; and, in some rare cases, urinary fistulæ remain.

Inflammation and suppuration of the cellular tissue surrounding the bladder, are invariably found after fatal operations for lithotomy, attended with the symptoms which have been already described in Chapter VII.

CHAPTER X.

WOUNDS AND INJURIES OF THE BLADDER.

"Wounds of the bladder," says Liston,[1] "within the peritoneal sac, or even behind the reflection of the pelvis fascia, are almost inevitably mortal; they may be inflicted from without, by pointed weapons, or from within, as in rash and ill-conducted operations for stone; or they may be the result of violent injury and solution of continuity in the bones of the pelvis. I have seen some accidental wounds of this viscus, from which patients have recovered very favourably. A wound of the posterior fundus, through the rectum, if it does not pass beyond the bladder, is not necessarily attended with great risk." Foreign bodies, as bullets, have entered the viscus at various parts, the immediate effects of which have been recovered from, and their removal has, after a time, been accomplished by incision of the perinæum.

In fractures of the bones of the pelvis, the bladder is often injured, either by the force of the concussion, or by a spicula of the fractured bone penetrating the coats of the bladder.

I have known the bladder ruptured by a fall from the top of a coach. A gentleman was riding on the box, with his own coachman, when the carriage was upset, and the coachman fell on him, by which accident the bladder was ruptured. The patient lived from the Sunday till the following Wednesday.

The bladder is sometimes ruptured by external violence, in boxing matches. In these, if one throws the other on the ground, he may fall upon him with his knees; and, as the bladder may then be full from previous drinking, its rupture has occurred.

The bladder, when excessively distended, may give way; a case of this kind is mentioned by Sir E. Home,[2] and another by Dr. Johnstone.[3] In such cases, the urine escapes into the cavity of the pelvis, and all that we can do, is to introduce a catheter, and leave it in the bladder, in order to limit, as much as possible, the quantity of effused urine.

These cases almost always terminate fatally; and on examination, the cellular tissue of the pelvis is found in an inflamed, or rather sloughing state.

The bladder has been known to burst in cases of labour; and most practitioners concur in thinking that such an accident must always be the effect of neglect or improper interference. One cause of laceration of the bladder may be the use of instruments in a distended state of this organ. If the forceps are applied whilst the bladder is full, the action of the instrument is likely to produce

[1] Practical Surgery, p. 393.
[2] Home on Strictures, vol. ii. p. 241.
[3] Memoirs of the Medical Society, vol. iii.

laceration of the bladder, and this is known by the immediate and constant flow of urine through the opening.

In consequence of the undue pressure of the head of the child, destruction of a portion of the vagina and bladder takes place; and this occurrence is attended with most distressing symptoms. The urine dribbles away as fast as it is secreted, and excoriates the neighbouring parts. The protruded mucous surface of the bladder is very sensitive, and the vagina is frequently contracted in size by firm bands, extending across it in different directions. With all these local symptoms, the patient's general health is but little affected. I have seen four or five instances of this complaint, in all of which little could be done in the way of relief. The late Mr. Earle published, in the fifth volume of the Medical Gazette, a valuable paper on this complaint, an abstract of which I subjoin.

The sources of difficulty attending these cases are manifold. One is, the continual flow of urine, and the vicinity of the termination of the ureters. Another is the very narrow space for performing any operation, often rendered more narrow by preternatural contractions, and firm cicatrised bands. A third source of difficulty in attempting any operation, arises from the exquisite sensibility of the exposed mucous membrane of the bladder. Next, the moist, unresisting, elastic surface, eludes the impression of any cutting instrument, the edge of which is almost immediately blunted by the action of the urine. Even when these are surmounted by perseverance, and a modification of the various instruments, such is the influence exerted over the pelvic viscera by the slightest movements of the viscera of the abdomen, and by the action of the abdominal muscles and the diaphragm, that the adaption of the denuded surface is often frustrated, and even the sutures forcibly torn away, by a single effort to cough or sneeze.

"When the opening," continues Mr. E., "is not situated between the urethra and ureters, or in the neighbourhood of the latter tubes, when it is not of great magnitude, and when there is not much hernia of the bladder, we may attempt to remove the callous edges, and unite them by the assistance of sutures. We shall be much facilitated in this operation by previously dilating the urethra sufficiently to admit the fore-finger of the left hand; by which we shall be enabled to draw down the bladder, and to afford a support and resistance in removing the edges. The instruments best adapted for this purpose, are very narrow double-edged scalpels, or lancets, with which we may pierce through the membranes, and cut our way outwards. These should cut only to a short distance from the extremity. It will be better to commence at the extreme edges of the opening, and not to attempt to effect too much at any operation. By several operations, we may gradually diminish the aperture, but by attempting too much, we shall be foiled altogether. In order to convey a suture through the edges, to hold them in contact, it will be necessary to employ port-aiguilles, with grooves, which will hold a short triangular glover's needle at different angles, and with slides adapted for holding or letting loose the

needle. The following is the mode in which I have employed this. An armed needle should be fixed at the angle most convenient for piercing the denuded edges of the wound, which should be directed by the finger, and carried through the two edges. The point should be received by the other port-aiguille, and the slide pushed up to fix it. The slide of the first should then be drawn down, which will leave the needle in the grasp of the second, by which it may be drawn through with its thread attached. To effect this in so narrow a space as the vagina, is often most difficult, and requires much patience and dexterity. The ligature should be drawn tight, and the ends cut off. I have also employed short hare-lip pins, and the twisted suture; but these are still more difficult to pass, and cause much more irritation. In those cases which, from the situation of the opening, or its magnitude, no curative means can be attempted, a well adapted truss, with an elastic gum pad, will often enable the patient to retain a considerable quantity of water, and to enjoy comparative comfort."

THE

CROONIAN LECTURES,

FOR 1838.

BY JOHN CLENDINNING, M.D., F.R.C.P.

EXPERIMENTS AND OBSERVATIONS RELATING TO THE PATHOLOGY AND PATHOLOGICAL RELATIONS OF THE HEART.

INTRODUCTORY REMARKS.

In physiology, healthy and morbid, there may be distinguished two great classes of functions, which differ very much from each other in the laws which govern them, and the elements and agencies by which their ends are effected. I mean, first, those that are constituted by powers which are dynamic, or *vital simply*, such as those peculiar to the sensorium, to the muscular fibre, to the blood, and the analogous powers and actions in the vegetable physiology—functions whose peculiar conditions and phenomena admit of no mechanical, chemical, or other physical explanation. And secondly, those functions that are of a mixed nature, and to the effectuation of which, organic powers and purely vital properties contribute but in part, often but indirectly, and in which material elements, as carbon, oxygen, &c., and physical forces, chemical or mechanical, are the principal agents. Of the latter, or mixed class, are the visceral functions, with the exception of those of the encephalon and spinal brain; the functions, also, of the secreting surfaces; and generally all those involuntary actions, organic and humoral, that contribute to the work of *nutrition*, whether in a principal and direct manner, as those of the heart, stomach, and lungs; or merely secondarily, and as subsidiaries, as appears to be the duty of the liver, spleen, pancreas, kidneys, skin, and lower intestines. Of these two classes of functions, the former, or the purely dynamic and vital powers and functions, possess in themselves a high and peculiar interest. They are most variously and amply developed in the higher animals, and stand out most prominently in that department of organic nature in which alone man can justly claim for himself pre-eminence above other animals; I mean the moral and intellectual. They have likewise peculiarly mysterious laws, energies, and modes of operation; and at the same time have very extensive relations to, and exercise vast disturbing and otherwise modifying powers over, the material elements and forces, amid which, and by the support of which, they exist in the organisms. Owing to these and other causes,

the constitution and government of the nervous organs have of late been very laboriously investigated; and, considering the imperfection of the methods used by many enquirers, have been investigated with much success; and from those researches unquestionably some advantage has been derived in clinical practice, and more may in future be expected.

PARAMOUNT IMPORTANCE OF THE NUTRIENT FUNCTIONS IN GRAVE DISEASES.

But it does not seem to be from that quarter that the largest accessions to curative power may be looked for, but rather to researches calculated to elucidate the laws of functions less ethereal and noble than those that refer to the external world, and the continuation of the species; those functions, namely, whose appropriate end is the preservation of the individual, and which, collectively, may, in a large way of speaking, be called the *nutrient functions*. The functions of relation, both the sensorial and the sexual, have paramount interest and importance for the moralist, the naturalist, and the philosopher; indeed, of every colour and character of mind. But to the practitioner of medicine, the paramount function is that of *nutrition* broadly understood, so as to include all the viscera of the chest and abdomen, with their dependent tubes and appropriate stimuli.

The nutritive forces are those that operate the growth and decay of the structures, and determine the character, and regulate the amount of those organic and humoral powers and capacities which are the material causes of life. Almost all grave diseases, whether acute or chronic, are complicated with, or even dependent on, organic changes of condition, implying *abnormal nutrition;* for example, inflammations, acute and chronic, common and specific; and, in fact, all the varieties of the phlogistic process; also, in popular terms, all dropsies, consumptions, asthmas, and palsies, which are at present the great outlets of life, and are known to depend on various modifications of nutrient action in the brain, heart, and lungs. And as the suffering and mortality of such diseases are the results mainly of irregular efforts of the *nisus formativus* or *nutritivus*, which seem to me to be in effect the same thing, so the cure of them must consist mainly either in repressing that force, or stimulating it, or altering its direction.

And the relative importance of the nutrient function, as a subject for professional study, and medicinal regulation, in the treatment of grave diseases, is, it is conceived, still more important in the present than in former ages; and for this reason. Of late years, disease has apparently become more simple as a whole, by the abstraction of a large part of the humoral depravities, that seem to have been main causes of the mortality of the plagues and epidemics in general of past ages. The less favourable crasis of the humours alluded to, appears to have originated from various causes in various combinations, especially in frequent scarcities and famines; in habitual excess in salted food, and deficiency of

wholesome vegetable food, during the winter and spring seasons; and in defective domestic and personal cleanliness; and defective atmospherical purity at all times. To the preceding may be added, frightful abuse of alcohol by all classes; and very unskilful use of authority in what was intended for wholesome regulation of industry by legislators and magistrates; and, as a consequence of all the circumstances referred to, extreme mental depression, interrupted only by occasional convulsive excitement in the dark and miserable masses. To all these popular conditions, as remote causes, I would attribute those abnormal states of the vital powers in solids and fluids, which sprang more immediately, of course, out of extremely defective composition, distribution, and depuration of blood; and which, however caused, gave to the endemic and epidemic diseases of those times a tendency to maculæ, hemorrhagic exudations, fetid and otherwise foul and anomalous excretions, with asthenic delirium or typho-mania, &c. &c.—in a word, to intense malignity of disease, humoral and nervous, such as we now rarely witness; and which, should it reappear, would now, as then, unquestionably produce frightful mortalities and devastations. Now, such causes of humoral vitiation and anomalous vital conditions, and, in general, of inferior tenacity of life, no longer existing in their former intensity to complicate morbid states and mask diseases, it results that disease consists at present more in simple defect or excess, material or dynamic, and less in perversion or qualitative changes; and that, therefore, the business of treatment is more simple, and, owing to its greater simplicity in great part, more efficient. Also, that from the mitigation of many causes of malignant disease, and the apparently superior average tenacity of life, the chronic class of disorders preponderates over the pestilential and acute; or, in other words, those diseases recede, in which the frailty of the subject, and the intensity of the morbific agencies, leave little room for curative skill, from the rapidity of their march, or the mysterious complexity of their causes and symptoms; while those other diseases advance in relative frequency and importance, whose slow progress and protracted duration give time and opportunity for the safe and efficient employment of the resources of a therapeia as yet very limited in its means, to a great extent merely tentative in its nature, and in its daily exercise restricted by various considerations and circumstances, moral, physical, and prudential.

SPECIAL OCCASION AND OBJECTS OF THE ENQUIRY.

Under such impressions, whether erroneous or not, it has long seemed advisable, that the especial attention of such pathologists as are practitioners, and have opportunity, should be fixed on the vast and complicated apparatus whose end is *nutrition;* or the due preparation, purification, and distribution of nutrient fluids; and that to increase the probabilities of success, it would always be advisable to use, where practicable, *instrumental aids* to observa-

tion, and to adopt simple but accurate methods of recording the results; and thus to depend as little as possible on *conjecture* in observing, or on *memory* in recording. And so far as opportunity permitted, I have myself acted on those views, more especially as regards the great organ of nutrimentary distribution—the heart; and although I have by no means completed the limited enquiries, which, as not beyond my powers or opportunities, I have conceived myself warranted in attempting, yet I have, I imagine, already arrived at some results, not, so far as I know, generally known, and yet of some interest—results which I propose to make the subject of the present lectures.

IMPORTANCE OF ACCURATE KNOWLEDGE OF HEART DISEASE.

I have already stated that the especial object of my enquiries has been the pathology and pathological relations of the heart. My attention has not, indeed, been limited to that organ; on the contrary, it has been endeavoured to embrace in the enquiry all the viscera; but the heart has been the especial object of observation, and that for various reasons, but principally this, that I found disease of the heart, simple enlargement with thickening usually, in a large proportion of fatal cases of adults, whatever might be the name or supposed proximate causes of the diseases preceding death; so that, in male adults, *morbus cordis* seemed, in official practice at least, to occur more frequently than phthisis, which I had previously believed to be, at all ages above puberty, the principal fatal disease of these climates. And further, this contributed to fix my attention on the heart, viz. that in almost all the cases of asthmatic and chronic catarrhal or bronchitic disease that I had met with in persons of mature years, and especially in males, in eight and even nine cases out of every ten, I thought I met with hypertrophy of at least the left ventricle of the heart. Such perpetually recurring disease of the heart, either as a direct cause of death, or as a complication of fatal diseases of other organs, seemed to warrant the opinion that to the heart might be attributed a large share of the fatality of many diseases and cases of diseases in which no suspicion had been entertained of any defect in that capital organ. I had also had several opportunities of feeling the want of some standard or measure of health more accurate than the *closed fist* of the subject, which seems to have satisfied the illustrious Laennec; having on several occasions known hearts to prove decidedly hypertrophous by instrumental measurement, which had by able anatomists and highly-informed pathologists been previously pronounced normal, more especially in cases where death had supervened quickly on acute complaints, and where no important lesion was observable of the valves, pericardium, or aorta.

DEFINITION OF HEALTH IN THE HEART BY MEANS OF INSTRUMENTAL MEASUREMENT.

The facts just alluded to, and more especially those last referred to, suggested the propriety of endeavouring to define, as precisely

as might be, the limits of health and disease with respect to that organ; and especially to fix as accurately as I could the limits of healthy development and nutrition, as opposed to the hypertrophous state on the one hand, and the atrophous on the other. The object just stated I selected for enquiry before others, for several reasons, especially these two—that it was *easier*, as admitting more fully of instrumental assistance, and that it was *more necessary*, as being peculiarly useful in the study of hypertrophy, which I soon convinced myself was the principal element in importance, because the most frequent of occurrence, and the most extensively mischievous element in diseases of the heart. For the purpose just stated, then, measurement by bulk and linear measurement, as well as measurement by weight, presented themselves for adoption. But I found linear observation too difficult and uncertain, from variability and irregularity of shape, from organic flaccidity, and other mechanical circumstances; and measurement by bulk, in a fluid contained in a graduated vessel, I found to be but partially applicable, owing especially to the wide distance between the extremes—between enlarged adult livers, emphysematous lungs, &c., on the one hand, and infant hearts, cerebella, spleens, &c., on the other; so that I found measurement by weight in air the only method generally applicable and convenient, and the only mode at all quite obviously by which the ratio of any viscus of the whole person could with any approach to precision be attempted to be ascertained. This mode I likewise found abundantly *accurate*, as well as easy in practice. I accordingly extended to the heart the practice of measurement by weight, previously applied to the encephalon by several observers, and on the largest scale, and with most success, by my friend, Dr. Sims, as evidenced in his instructive paper published in the 19th volume of the Medico-Chirurgical Transactions; applied to some extent also in France to the heart itself by Bouillaud, as previously by Senac, and cotemporaneously by Lobstein, Cruveilhier, &c.; also by Meckel, in Germany, and some others.

This method of measurement by weight, for reasons hereafter to be stated, was subsequently extended to all the viscera where practicable, and as often as possible was made to include the person of the subject likewise. To measurement by weight were added, in many instances, measurements also by bulk, with the view of determining the density of the viscera in various conditions; and these observations have been now long enough in progress to admit of inferences, founded in several instances on facts, occurring in several hundred subjects.

Early last year I had the honour of laying before the Royal Medical and Chirurgical Society a paper, communicating some of the conclusions first arrived at, and founded on observations embracing between two and three hundred subjects. Since that time, owing to the kindness of several friends in great part, I have been able to enlarge my facts by new accessions to double the number at my disposal last year, and am thus in a position to

repeat, with additional evidence, certain statements of that paper, and to mention other additional results not known to me, or (for reasons not necessary to mention here) not stated on that occasion.

The first step, then, appeared to be, to determine, with as much precision as my materials would admit, the normal dimensions of the heart, its normal bulk, weight, and density.

From want of precise data on this point, it appeared that mistakes had been made from time to time by pathologists and practitioners, which might otherwise have been avoided. Diseases and symptoms, properly referable to the heart, have often been ascribed to pulmonic affections, or to chronic disorders of the liver, or spleen, or other abdominal viscus; and in cases of complicated disease, in not a few instances, disease of the heart, not including valvular defect or pericarditis, has been entirely overlooked, and the whole of the morbid actions referred to other organs, themselves probably in many cases not principals in the morbid causation, but merely secondarily affected, and in consequence of the disease at the centre of circulation. Of this there will heareafter be proof offered, consisting of facts and inferences that have convinced my own mind at least, that much as has been written on diseases of the heart, it still remains to be determined with precision what constitutes disease of the heart—what are the anatomical and physical evidences of the most important species of disease of the heart—or, in other words, what limits divide hypertrophy from normal nutrition of that organ.

NORMAL ABSOLUTE WEIGHT AND VOLUME OF THE HEART.

With a view, then, to determine the normal dimensions, &c., of the heart, nearly four hundred hearts were examined and weighed, and distributed into groups in tabular forms, distinguishing age and sex, and placing all cases of *morbus cordis* and of *phthisis* apart from the other cases, for reasons which, if not obvious, will presently appear. It is proper to mention that the diseases of almost all the subjects of observation are known, and that in most cases pretty full notes exist of the morbid appearances, and are in my own possession.

The first part of the table contains the weights of between eighty and ninety hearts of males above puberty, who died of various diseases, not morbus cordis or phthisis, and distributed into groups or columns, according to age, viz.—

15 to 30 years of age.
30 to 50 " "
50 to 70 " "
70 to 100 " "

The second part of the table contains like particulars, regarding more than one hundred female subjects, dead of other diseases than pulmonary consumption, or disease of the heart, and distributed in similar groups or columns, according to age.

Now, according to the first part of Table I., containing normal

hearts of males, we have as our average for the years 15 to 30 (68 oz. 10 dr. ÷ 8 =) 8½ oz., which is nearly the average assumed in the paper above alluded to for the whole of life. For the ages 30 to 50, we have for the average weight (228 ÷ =) 9½ oz.; and if we exclude from the total, of which the quotient is 9½, such hearts as exceeded 11 oz. in weight, which is an ounce above the ordinary limit of health assigned by Senac, Lobstein, Meckel, and Bouillaud, and much more above the normal standard according to Cruveilhier, we shall then have (228 — 93 ÷ 16 =) 8·85, or 8⅞ oz.

Then in the next interval of age we have 33 hearts, giving an average (336 ÷ 33 =) 10·17 oz. or 10⅛ oz.; and if we exclude from the division, 10 hearts of 11 oz. and upwards, as in the last case, we have a net average of 9·33 or 9⅓ oz.

In the fourth interval of age, viz. 70 and upwards, there are 15 hearts giving a gross average of 10½ oz.; and excluding 4 of 11 oz. and upwards each, we have a net average of 9·75 or 9¾ oz., and for the whole four columns we have a gross average of 9·45, and a net average of 9 oz., for the life of males above 15 years of age.

In like manner, in the second part of the table, we have for females the following averages, viz:—

15 to	30	years	of	age	gives 8·14 or 8⅛ oz.
30 to	50	"	"	"	8·33 or 8⅓ oz.
50 to	70	"	"	"	8 oz. nearly.
70 to	100	"	"	"	8 oz.

And the whole four columns give an average for life of 8·26 or 8¼ gross average, and 8·12 or 8⅛ oz. net average, from puberty to extreme age.

COMPARISON OF ESTIMATES.

Now, with respect to those averages, I may remark, before proceeding farther, that they agree very well with the estimates of Senac, Meckel, Lobstein, and Bouillaud, which were deduced from much smaller numbers apparently, and which are:—Senac, 8 to 10 oz.; for Lobstein, 9 or 10 oz.; for Meckel, about 10 oz.; and for Bouillaud, for both sexes, 8½ oz., nearly avoirdupois; and there is much reason to believe, that if they had attended to distinction of age and sex sufficiently, which it is clear none of them has done, their estimates would still more closely correspond with those of the present tables. Cruveilhier's estimate, I must however observe, agrees very indifferently with mine; but I may add, that it does not, so far as I know, appear that he drew his averages from a total sufficiently large, and there is good reason to think that he too paid inadequate attention to the distinctions of sex and age. His estimate for the healthy adult heart is 6 to 7 ounces—an estimate too low, according to my observation, for any age above 10 or 12 years, or for any class of patients except females dead of cancer.

TABLE I.

Table of *Hearts*, divided into four sections, according to age, namely, 15 to 30 years of age, 30 to 50, 50 to 70, and 70 to 100, distinguishing the sexes, and giving total number of observations, total weights, and average weight for each interval of age and each sex, and distinguishing phthisis and morbus cordis from all other diseases and cases; and adding for each class the average for life above puberty.

			15 to 30			30 to 50			50 to 70			70 to 100			Total of Obs.	Average for life above fifteen.
			No. of Obs	Total Weight.	Average	No. of Obs.	Total Weight.	Average.	No. of Obs.	Total Weight.	Average.	No. of Obs.	Total Weight.	Average.		
				oz. dr.			oz. dr			oz. dr.			oz. dr			
Varia exclusive of phthisis, &c.	* *Gross*	Totals and averages.	8	68 10	$8\frac{1}{2}$	24	228 2	$9\frac{1}{2}$	33	336 2	$10\frac{1}{6}$	15	$156\frac{1}{4}$	$10\frac{1}{2}$	80	9·45
Varia exclusive as before.	† *Net*	Totals and averages.	8	68 10	$8\frac{1}{2}$	16	135	$8\frac{1}{2}$	23	215	$9\frac{1}{3}$	11	107	$9\frac{3}{4}$	58	9·00
Phthisis, averages, &c. . . .		Males.	11	$86\frac{3}{4}$	8	19	$181\frac{3}{4}$	$9\frac{1}{2}$	17	$160\frac{3}{4}$	$9\frac{2}{5}$	3	$28\frac{1}{4}$	$9\frac{1}{3}$	50	9·06
Morb. chron. cordis.			5	$72\frac{3}{4}$	$14\frac{1}{2}$	24	$409\frac{1}{4}$	17	34	$513\frac{3}{4}$	15	13	195	15	76	15·33
Varia exclusive of phthisis, &c.	* *Gross*	Totals and averages.	20	163	$8\frac{1}{7}$	31	$266\frac{3}{4}$	$8\frac{3}{5}$	30	245	$8\frac{1}{6}$	24	$186\frac{1}{4}$	$8\frac{1}{6}$	105	8·26
Varia exclusive as before.	† *Net*	Totals and averages.	20	163	$8\frac{1}{7}$	28	233	$8\frac{1}{3}$	27	212	8	23	184	8	98	8·12
Phthisis.		Females.	8	$56\frac{1}{4}$	7	8	70	$8\frac{3}{4}$	9	69 10	$7\frac{3}{4}$	2	14 10	$7\frac{1}{3}$	27	7·47
Morb. chron. cordis. . . .			5	$61\frac{3}{4}$	$12\frac{1}{5}$	8	99	$12\frac{3}{8}$	16	234 14	$14\frac{1}{2}$	14	175	$12\frac{1}{2}$	43	12·75

* Gross totals include *all cases* not known to be diseased during life, and not *obviously* altered in structure.

† Net totals include *no hearts* amounting to 11 oz. avoirdupois, or upwards.

Note.—All the weights avoirdupois.

Grand total of observations. . { Males 206 / Females 175 } = 381

N. B—The observations made all within the same period, and without selection of cases.

ADVANTAGES OF THE MODE OF TABULATION ADOPTED.

I may be permitted to remark, as to the tables, in explanation of their construction, that I have had a two-fold end in view in arranging the facts in groups, according to age and sex. One reason was this: supposing the sum total of cases, without distinction of sex or age, to be large enough to yield an average pretty nearly approximating to the truth, it might, on arithmetical grounds, be expected that the general average would pretty nearly agree with averages obtained from any large sections into which the general total might be divided, and that any excess or defect in any sectional average, as compared with the general average, would be found to be compensated for by an opposite error in some other section. And the division into sections, without diminishing the facility of obtaining a general average, promised this important additional advantage; that it would enable me to detect any marked deviation from the general average that might be produced by differences of age or sex. Accordingly, both these advantages have been obtained by the mode of tabulation adopted.

Our absolute average weight, then, exclusive of phthisis and morbus cordis, for the adult, is, for the male 9 oz.. and for the female nearly an ounce less, by this first and simplest method of attempting to define the limits of health, viz. totaling up the separate measurements, and dividing by the number of hearts measured, and assuming the quotient as the normal average weight or measure.

NORMAL RELATIVE WEIGHT OF THE HEART.

But is seemed desirable to obtain not only the absolute average weight of the heart, but also the ratio of its weight to those of other organs, and to that of the person. This has been attempted by several naturalists for the brain, and quite recently again, by an illustrious German physiologist, and with some success; and though the peculiar dignity of the cerebral functions would give importance to any even partially successful attempt to elucidate their laws and causation, yet it appeared that the example of Tiedemann might, with advantage, be followed with respect to the heart also; and the attempt has accordingly been made.

RATIO OF HEART TO LUNG.

Amongst the other viscera, the lungs have been selected as the most intimately connected with the heart in function, and at the same time is, if the heart be not an exception, the most important instrument of the organic life. However, of all the organs, the spleen not excepted, the lungs are most variable in volume and density, and of course in weight, so that for want, unquestionably, of sufficient repetition, the success of this method of defining the limits of health in the heart has not yet been such as I should wish.

However, the results are as follows, dividing the cases into three

classes as before, viz.—1. Varia, or various diseases, exclusive of phthisis and morbus cordis; 2, phthisis; and 3, morbus cordis; we have, as average ratios for the whole of life above fifteen years, the following:—

For the first class we have,—
For the male, the ratio of . . . : : 1 : 5·28, and
For the female, ... : : 1 : 4·18

For the second class we have,—
For the male, the ratio of . . . : : 1 : 7·19, and
For the female, ... : : 1 : 4·60

For the third class, or morbus cordis, we have,—
For the males, ... : : 1 : 3·79, and
For the females, ... : : 1 : 3·06

And for all the three classes, viz.—1, varia, or various diseases, excluding consumption and disease of the heart; 2, phthisis; and 3, morbus cordis, we have the general average,
For the male, ... : : 1 : 5·42, and
For the female, ... : : 1 : 3·95

Now, if the normal weight of the lungs were known, it would seem that the knowledge of such ratios, supposing them correct, would help us in practice to determine the normality or abnormality of the heart's nutrition or dimensions; and if the ratios between the organs under consideration were deduced from a sufficiently large number of instances, it would certainly be available for that purpose. But for that end a very large number of observations indeed would be required, much larger than are at present at my disposal.

NORMAL RATIO OF THE HEART TO THE WHOLE PERSON AFTER DEATH.

To proceed, then, to the other mode of fixing the normal dimensions of the heart by *relative* measurement; the necessity of this method, in addition to ascertaining the *absolute* weight, is obvious from several considerations, but especially from this, that the heart varies in size, not strictly proportionally to, but still varies with the temperament, sex, stature, and conformation. The stature, especially, is well known to affect the dimensions of the heart, so that, excluding mere fat, a large person always implies a large heart, and, *vice versâ*, a slender person, *cæteris paribus*, a small heart; and to remove this source of doubt, there was no remedy but ascertaining the weights of both heart and person in a large number of cases of persons dead of known diseases. This attempt has been made, and the ratio ascertained as accurately as nearly two hundred observations would furnish the necessary data. These results are contained in the second table, or table exhibiting the ratio between the heart and person in one hundred and ninety-four observations, distinguishing sex and age, and distinguishing other diseases from phthisis and morbus cordis, and these latter also from each other.

TABLE II.

Table of Ratios of Hearts and Persons in 194 cases, viz. 108 males, and 86 females, giving number of observations, and distinguishing sexes, ages, and diseases, as in Table I.

		15 to 30		30 to 50		50 to 70		70 to 100	
		No. of Obs.	Ratio of Heart to Person.	No. of Obs.	Ratio.	No. of Obs.	Ratio.	No. of Obs.	Ratio.
			Hea. Per.		Hea. Per.		Hea. Per.		Hea. Per.
Male.	Varia,	9	1 to 164	8	1 to 150	18	1 to 161	7	1 to 155
	Phthisis,	6	1 160	11	1 146	8	1 154	3	1 136
	Morb. cordis,	3	1 115	11	1 121	20	1 119	4	1 124
Female.	Varia,	17	1 169	13	1 161	22	1 147	6	1 121
	Phthisis,	6	1 162	2	1 199	4	1 150		
	Morb. cordis.	3	1 100	3	1 107	7	1 134	3	1 115

	Totals of Obs.	Averages for Life
Male.		
Varia,	42	1 to 158
Phthisis,	28	1 149
Morbus cordis,	38	1 120
Female.		
Varia,	58	1 149
Phthisis,	12	1 170
Morbus cordis,	16	1 114

Averages for life for all diseases, and both sexes, and all ages, { Males, 1 to 142 / Females, 1 to 144¼

According to this table, the ratio for all diseases, exclusive of phthisis and morbus cordis, is, for males,

From 15 to 30 years of age :: 1 : 164
" 30 to 50 :: 1 : 150
" 50 to 70 :: 1 : 161
" 70, and upwards :: 1 : 155

For females in like manner, the ratios of healthy hearts to their persons are,

From 15 to 30 years of age :: 1 : 169
" 30 to 50 :: 1 : 161
" 50 to 70 :: 1 : 147
" 70 and upwards :: 1 : 121

And the general averages for each sex of this class, or healthy hearts are, for life, above 15 years, for males :: 1 : 158, and for females :: 1 : 149.

Now the accuracy of these approximations to the true ratios has been tested, amongst other methods, by comparing them with the ratios deduced from two other classes of cases; one remarkable for the nearly uniform increase of weight on the side of the heart; and the other equally remarkable, in general opinion, for invariable loss of substance and diminution of weight and bulk in the person. I mean, of course, morbus cordis and phthisis; and the discrepan-

cies between the results are just such, I think, as I should expect, assuming the ratios found for the normal heart to be nearly correct. They are as follows:—In every one of the four intervals of age, on the male side, we find the heart bear a smaller proportion to the person in the class *Varia*, or that of normal hearts, than in either of the others; while in the class *Morbus Cordis* we find, as might be anticipated, the ratio of the heart to the person greater than in any of the others, and the class *Phthisis* occupies, in this respect, a middle place, the heart in that class being larger with respect to the person than in the class *Varia*, and less very much than in the class *Morbus Cordis*. In the class Varia, the male heart constituted 1-158th of the person; in the class Phthisis, 1-149th, and in the class Morbus Cordis, 1-120th. In the female division, again, the ratio is most favourable to the heart in Morbus Cordis, and least favourable in the class Varia; while at least in the first column which contains the largest number of observations, the class Phthisis occupies, as with the males, the middle place in the ratio of the heart to the person.

Before concluding the subject of the ratio of the heart to the person, let me add the following fact in confirmation of the approximative correctness of the ratios stated as obtained in the case of adults. I have had opportunity of ascertaining the absolute and relative weights of the heart and person in twenty-three cases of persons under puberty; the majority under 5 years of age, and nearly equally divided between the sexes, and I find the average for the males to be :: 1 : 146, and for the females :: 1 : 153. and the common average ratios :: 1 : 149. Now, if we consider the greater activity of the heart in early life, we shall see at once a final cause or reason why the heart should bear a higher ratio to the person than in adult life; accordingly in infancy the organ is relatively weightier than afterwards, until decrepitude; and for two especial causes, viz. first, that it is rather thicker comparatively, in its walls, especially on the right side; and, secondly, that it is all muscle, and contains no fat whatever. The ratio of 1-150th part of the person may be considered, therefore, as an agreement with the post-mortem ratio for adults of ordinary stature and corpulency, as close as could reasonably be looked for, and a confirmation of no small weight of the approximative accuracy of that ratio.

Let me add, that this ratio differs materially from that given in Meckel's Handbuch, which is, :: 1 : 200 for the adult, and :: 1 : 120 for infants and children; but Meckel has not given particular observations, nor, indeed, particulars of any kind, except those just quoted, and probably had not at his disposal a sufficient number of measurements; and further, very possibly paid insufficient attention to differences of sex, age, disease, &c.

NORMAL BULK OF THE HEART.

Then as to the results of measurement by bulk. My observations under this head amount to somewhere about fifty, including

all ages and diseases, and both sexes; and are only so few from finding the difference between the measurements in air (weight) and water (bulk), at all ages, in all diseases, and in both sexes, so inconsiderable that, even in the largest hearts, the former scarcely ever fell more than an ounce short of the latter; so that in every case the weight in air could be inferred from the bulk in ounces of water, and the bulk from the weight, to within a few drams at the most, with much confidence.

DENSITY.

With respect to the density, likewise, it may be anticipated, from what I have just said, that though I have found considerable differences between individuals, yet there has been no constant difference between any two classes. The density was examined by two different methods; the one easier, but rather less accurate, perhaps —viz., by comparing the weight in air with the bulk in minims of water, by means of a graduated vessel; the other by the usual method of obtaining specific weights. The results obtained by those two methods agree in the general conclusions to which they lead; for though they differ from each other in every case, yet the excess is always on the same side, and of the same proportional amount, viz. about two per cent. By the former method, the density varied from 1050 to 1062; by the latter, the limits of variation 1030 and 1040.5; and in neither case was any striking difference detected in connection with morbus cordis, as compared with other diseases. From both sets of observations made by different methods, and on different subjects, and agreeing in placing the density of the normal heart rather above than below that of the diseased heart, it would seem to follow that the predominant tendency in excessive nutrition of the heart is to what may be called eccentric development; that its tissues grow in bulk rather than in density; and that the diseased heart is ordinarily more voluminous for its weight, and less solid for its consistency, than the normal heart. But additional observations are still necessary to warrant a confident opinion on the subject; of this I am fully aware, and it is my intention to repeat my trials as opportunity shall offer; but I am disposed to think that they are not extremely wide of the true proportions.

SUMMARY.

The normal heart, then, to sum up the whole of my observations together, may be assumed to average, for the whole of life above puberty, about 9 oz. in absolute weight, and 8½ in bulk, for the male, and 8 oz. or a little more in weight, and 7½ oz. or a little more in bulk, for the female; and to bear after death to the person, for the male, the rates of about 1 to 160; and for the female, of about 1 to 150. So that a male adult heart, considerably exceeding 9 oz. in weight, but not considerably exceeding the 160th part of the whole subject, might, for a person of the working classes, and of ordinary fatness but of much muscularity, be held to be

normal; while a heart of like absolute dimensions, but occurring in a subject of average stature and muscularity, would justly be considered hypertrophous, although, owing to general obesity or œdema, it should not exceed, or should even fall short of, the 160th part of the weight of the person. And this observation applies, *mutatis mutandis*, to the female; in whom, I think, the extremes of obesity and leanness more frequently occur than in the male; with respect to whom, therefore, this qualification of our rule of measurement is even more necessary than with regard to the other sex. The female stature and muscular developements vary considerably less than the male, and the limits of normal nutrition and volume of the heart are consequently narrower; so that any female heart greatly exceeding 8 oz. in weight or volume, may *ipso facto* be suspected of hypertrophy, whatever may be its apparent anatomical condition; and but few instances indeed, if any, will be met with, I apprehend, of female hearts exceeding 9 oz. in volume, or 9½ in weight, in the persons of individuals of ordinary stature and conformation, that had been quite free from pectoral disease during their lives.

INFLUENCE OF AGE ON THE DEVELOPMENT OF THE HEART.

In the course of some observations upon the mode of construction used in the table of the heart, one advantage expected from the plan adopted was stated to be, that it would render evident, without special search, any difference in the nutrition and development of the organ that might depend on age or sex. In fact, in examining my papers, in preparing the communication above alluded to, as read before the Royal Medical and Chirurgical Society last year, I found reason to conclude that the heart increased in weight and volume with increase of years; and this conclusion was stated to the meeting before which the paper was read. From the first volume of the Transactions of the Medical Society of Observation of Paris, it appeared that Dr. Bizot, then of Paris, had previously arrived at that conclusion by a method quite different from mine, viz., by linear measurement alone. Dr. Bizot's conclusions were founded on a total of observations of one hundred and fifty, or more, and mine on a total of rather less; but the agreement in result, of two enquirers proceeding by methods so different, was striking, and their common conclusion resting on two different and independent lines of evidence and sets of observations, laid claim to a high degree of probability. However, in the numerical method, at least, if not in all methods of interrogating nature, multiplication of instances is every thing; and when preparing these lectures, I of course endeavoured to turn to account the additional observations then at my disposal, for the confirmation of that conclusion if true, or its correction if erroneous. The result is, I think, decidedly in favour of Dr. Bizot's conclusion and my own, of which my readers will now be able to judge.

THE FORCE OF NUTRITION IN THE HEART INCREASES AS LIFE ADVANCES, PROVED BY INCREASING AVERAGE WEIGHT.

It has been already stated, in the account of the first table, that the average for the years 15 to 30, in the male was 8½ oz. in weight; for the years 30 to 50, the net average was still 8½ oz.; from 50 to 70, the net average rose to 9½ oz.; and above 70, to 9¾ oz. For the female the following averages were obtained:—15 to 30 years, 8¼ oz. 30 to 50, 8⅓; 50 to 70, 8 nearly; 70 and upwards, 8.

Now in both sexes there is an increase, though not of equal amount. The absolute increase of weight in the male heart, from puberty to extreme age, is near 13 per cent., or about one eighth. In the female there would appear to be, after 50 years, no absolute increase, but rather a diminution; not amounting, however, to more than about 4 per cent.: so that the tendency to increase is not apparent, judging by the absolute weight, except in the male sex. But if we take the table of hearts and persons, and examine the ratios at different ages, we shall find the female heart at least relatively increasing, from the first interval of age up to the end of life. The ratio of the heart to the person, is, in the female between 15 and 30 years of age, :: 1 : 169; in the next interval, it has changed to :: 1 : 161; in the third interval, it has advanced to :: 1 : 147; in the fourth interval of extreme age, it has attained to the ratio of :: 1 : 121. Whereas, in the male, in whom, judging by the absolute weight, the increase with years was obvious, there is, in the table of hearts and persons, a much less striking and regular gradation and increase. The ratio for the first interval is, for the male, :: 1 : 164; the ratio for the second interval is, :: 1 : 150; for the third we have :: 1 : 161; and in extreme age, the ratio :: 1 : 155. For the female, therefore, there is on the whole of life above 15 years, an increase of the ratio borne by the heart of nearly 29 per cent.; so that on the whole, the tendency in the nutrient force to sustain itself in the heart of the female, amid general wasting, and to increase its efforts in that of the male with advance of years, seems clearly evinced by the facts stated, and the conclusion at which Dr. Bizot arrived by the method of linear measurement, is again confirmed by the results I have obtained by weighing the heart.

PROVED LIKEWISE BY INCREASED FREQUENCY AND HYPERTROPHY.

Before passing on to the next topic, I would call attention to another fact already cursorily alluded to, and which, when properly understood, strengthens materially, I conceive, the opinion that in the male heart, at least, the nutrient forces are in no degree enfeebled by age, but are rather augmented. It is this. I mentioned two averages derived from different totals and divisors, when speaking of the table of absolute weight of the heart; the one table containing all hearts not obviously morbidly massive and weighty,

and not known, or on strong grounds not believed, to have exhibited, during life, sufficient signs of hypertrophy; the other containing no heart that materially exceeded those limits within which I have constantly found the healthy heart to fall. Having never, that I know of, met with an instance of a heart that had been functionally quite healthy, amounting in weight to 11 oz. even in males of ample size and stature, I have accordingly omitted, in the second or net table, all hearts reaching as high as 11 oz. Acting, then, on this rule, I have been obliged to omit, in the second or net table, altogether twenty-two male hearts. Now whether those larger hearts thus omitted in the net table as probably morbidly hypertrophous, and which had been included, I believe, in the gross total of healthy hearts only from imperfect knowledge of the health of the subjects, and whose excessive nutrition would probably, had opportunity offered, been made clear to me before death;—whether those hearts be considered morbid or not, their excess above the normal average evinces the tendency to augmented nutrition in the male of advancing years. The energy of any power can only be measured by its effects, and I can conceive no better method of measuring the energy of the *nisus nutritivus* in the heart, or any other organ, than by carefully measuring by weight the quantity of assimilated matter appropriated by, and embodied in, its structures. Assuming the correctness of this view, as it appears to me I may reasonably do, and reminding my hearers that hypertrophy is, physiologically speaking, but a modification of healthy nutrition, I think I am warranted in saying that the superior frequency of excessive nutrition in the heart, as compared with other organs, and more especially in advanced life, can only arise from a greater energy of nutrient action than is habitual in, and proper to, that organ; and that from such superior frequency of hypertrophy alone, might with much probability have been inferred, *à priori*, what Bizot's researches and my own seemed to have proved experimentally—viz. the existence in the heart of a nutrient force peculiarly energetic, not declining through age, as in other organs, but sustained throughout life as in the female, and even growing as in the male with years, contrary to the law of nutrition in every other organ, and in the whole person.

And the modification of the law of nutrition just pointed out, I may remark, before passing to the next topic, suggests an additional restriction of the rule by which the presence and amount of hypertrophy should be determined, and requires that in the male, at least, some allowance must be made for the physiological influence of age over the development and mass of the heart; a restriction that may require attention in judging of cases in which the excess of volume or of weight, absolute or relative, is moderate or disputed.

CARDIAC DISEASE USUALLY COMPLICATED WITH OTHER VISCERAL DISEASE; WHENCE A NECESSITY FOR FIXING THE NORMAL DIMENSIONS OF OTHER VISCERA, &c.

Having proceeded a certain length in the collection of facts, with a view to obtain correct estimates for the heart, I found that, to render those estimates fully available in the investigation of cardiac disease, it would be necessary to ascertain the normal dimensions of almost every other viscus. The relations of the heart are universal. As the main-spring, so to speak, of the circulatory apparatus, its action governs more or less the actions of all the vessels connected with it, while, through the intervention of those thousand subordinate channels, it distributes nutriment to every part, and receives from every part effete materials and recrementitious fluids. It is obvious, then, that any important modification of its vital powers and functional actions must be speedily and deeply felt all over the numerous and complicated organs and systems of organs that depend on it for the materials of life; and that in its graver diseases, and such more especially as permanently or frequently and greatly increase or diminish its energies and movements, much derangement might not unreasonably be expected in the condition of some or all the other viscera. And that this expectation is well founded, will presently be put in evidence. Meanwhile it may be allowable to glance at one or two other reasons for extending the enquiry, by weighing and otherwise measuring, to other viscera, besides the heart.

One reason is, that such an enquiry would possess physiological interest in so far as it would lead to show how far organic development is modified by sex, stature, race, age, and other influences, and strictly compatible with health. Another reason is, the advantage in pathological enquiries of having a standard by which to distinguish between atrophy and hypertrophy, to both of which every organ is subject, and the intermediate condition of normal nutrition. With respect to the former, or physiological uses of such an enquiry, it may be said that it naturally and necessarily precedes the solution, even partial, of several questions of the higher physiology. It is obvious that over and above the mechanical and chemical elements and forces, there are in the living organism vital or hyper-organic powers; and before the share of causation properly attributable to those latter and more subtle causes can be even approximatively determined, it seems plain that the extent to which that most complex condition or phenomenon, Animal Life, is effectuated by the material elements, as mechanical and chemical agents, must first be ascertained; and one of the first amongst the latter enquiries would necessarily be the determining of the law of organic nutrition and development.

Accordingly, the practice of measuring, of which some of the principal results with regard to the heart, lungs, and person, have

been already stated, was extended to the other viscera; and for a considerable period of time, in fact for some years, I have availed myself of every opportunity of collecting measurements by weight and otherwise of all the viscera, of the cranium, abdomen, and pelvis—a search in which I have been indebted to various friends for much valuable and obliging assistance; and of these trials I now proceed to examine the results.

The individual observations have been merged, as before, for convenience, in tables of totals and averages, and the normal average for each sex, and for four intervals of age for each of the following organs, are therein given—viz., the encephalon, the cerebellum, the liver, the stomach, the spleen, the pancreas, and the kidneys.

Weight of the encephalon and cerebellum, according to sex, age, and disease.—To begin with the encephalon. In order to ascertain the normal weight of that organ, or system of organs, I ascertained carefully the weight of between 220 and 230 encephala of persons dead of known diseases above fifteen years of age, and equally divided between the sexes. In 188 cases the cerebellum was examined apart from the whole encephalon, and in 34—viz. 8 males, averaging 45¼, and 26 females, averaging 43¾, no separate measurement of the cerebella was made; 140 of the 222 cases were examples of various diseases, exclusive of phthisis and morbus cordis; and of those 140, half were males, and half females. The whole of the first 188 were then arranged tabularly in four columns as before, for the remainder of life above puberty or fifteen years, distinguishing the sexes, and classing separately also the cases of phthisis and those of morbus cordis, and distinguishing likewise the encephalon and cerebellum, and the following are the results.

The two classes *varia*, in which, for reasons to be presently stated, are included no cases of phthisis or morbus cordis, gave the following averages, viz:—

	Enceph.	Cerebel.	Enceph.	Cerebel.	Enceph	Cerebel.	Enceph	Cerebel.
Males . . .	49.33	5.5	43.5*	5	45.80	4.80	47	4.80
Females . .	42.17	4.75	42.60	4.25	42.75	4.5	39.90	4
Ages . . .	15 to 30		30 to 50		50 to 70		70 to 100	

* Including three idiots, averaging for the encephalon less considerably than 40 oz.

And the average for each sex for life above puberty are, for the male encephalon 45½ oz., and for the females 42 oz.; and for the cerebellum the averages are, for the male 5.02 oz., and for the female 4.5. Now these estimates of the encephalon differ very materially from the only estimates I know that have been founded on extensive and accurate observation; viz. from those of Sir William Hamilton, of Professor Tiedemann, and of Dr. Sims. Sir William's average for the adult male is 48¾ oz. avoirdupois, and for the female 44 oz. Dr. Sims's average, deducible from his very

valuable table of weights of the encephalon, in the 19th vol. T.R. M.C.S.L., is for the male, from puberty upwards to extreme age, 46¼ oz. avoirdupois, and for the female 43¼ oz. avoirdupois; while Professor Tiedemann's estimate is highest of all, being, according to my calculations, 53¼ oz. avoirdupois for the male, and for the female 44¾.

Table of Estimates of Encephala. Averages for the whole of Life above Puberty.

		Male.	Female.	
		Gross.		
Tiedemann . .		53.25	44.75	No apparent distinction of disease.
		Gross.		
Sir W. Hamilton		48.25	44	No distinction of disease.
		Gross.		
Dr. Sims . . .		46.26	43.25	No distinction of disease.
		Net.		
1. J. C.		45.50	42	Phthisis and Morb. Cor. *excluded.*
		Gross.		
2. J. C.	104 m. 84 fe. 188	46.17	42.11	Phthisis and Morb. Cor. *included.*
3. J. C.	24 m. 10 fe. 34	45.75	43.25	Phthisis alone.
4. J. C.	33 m. 15 fe. 48	47.25	43.60	Morbus Cordis.
		Net.		
5. J. C. (cerebellum)		5.02	4.50	Phthisis and Morb. Cor. *excluded.*
		Gross.		
6. J. C. (cerebellum)		5.17	4.69	Phthisis and Morb. Cor. *included.*

The greatest difference is, of course, between the extremes of the scales of estimates, which are on the male side greatest, viz., between Tiedemann's and mine, and amount to nearly half a pound avoirdupois, or one sixth of the whole. Sir William Hamilton's estimate falls short of Professor Tiedemann's by five ounces, or near one third of a pound, and differs from mine by about one fifteenth. Dr. Sims's is something more than seven ounces, or 44-100ths of a pound lower than Tiedemann's, and exceeds my estimate by three quarters of an ounce. Then, on the female side, Tiedemann is nearly one sixth of a pound higher than my estimate; Sir W. Hamilton two ounces higher; and Dr. Sims about one ounce and a quarter higher than my average estimate. Now those differences are considerable. Professor Tiedemann and Sir William Hamilton, in particular, have obtained averages very greatly in excess, or else my averages, and I may add those of Dr. Sims also, err very seriously in defect.

Estimates differ, and why?—In explanation of those differences the following facts and considerations present themselves. First, with regard to the number of observations from which each has drawn his averages, it appears that Tiedemann possessed but fifty-two direct observations, including all ages and both sexes, and exclusive of negroes. The amount of Sir William Hamilton's direct observations appears to have been from sixty to seventy, including

both sexes and all ages; while Dr. Sims has given nearly 220 observations of subjects above puberty, and I myself a number of cases, above fifteen years, somewhat greater than that of Dr. Sims.

Now if the averages obtained from Dr. Sims's observations, without distinction of disease, and from my own, without excluding phthisis and morbus cordis, be summed up and halved, averages will thus be obtained drawn from about 450 observations, including both sexes, viz., for the male, 46.58 ounces; and for the female, 42.68 ounces,—averages not very considerably different from my own, and founded on a total of observations nearly eight times as numerous as either of the totals of Professor Tiedeman nor Sir William Hamilton; so that there is much reason, on the ground of superior extent of observation, to conclude that my estimate approaches very much nearer the true one than either of Professor Tiedemann or Sir William Hamilton. Then with respect to the difference between the results of Dr. Sims's observations and mine, there is a circumstance not belonging to this place, but to be enlarged on hereafter, that seems fully to explain that comparatively small difference.

In deducing their averages, distinction has not been made on the part of Professor Tiedemann, Sir William Hamilton, or Dr. Sims, as it has been for my own estimates, of the cause of death; and to this difference in the mode of investigating the matter, it appears to me may, with much probability, be attributed great part of the difference between the results to which our observations respectively lead; and, indeed, all the difference between Dr. Sims's average and mine. With respect to this cause of the difference between the results so often referred to, it will be sufficient at present to state the following averages. My average for various diseases, exclusive of phthisis and morbus cordis, and distinguishing the cerebellum, as already given, is for the whole encephalon 45.5 for the male, and 42 for the female; and if to those averages we add respectively the averages obtained from thirty-four other cases of various diseases, exclusive of P. and M. C., and of either sex, and in which no separate measurement was taken for the cerebellum—(viz. 45.25 for the male, and 43.25 for the female)—if we add those to the former and divide, we shall have from the whole 174 encephala the following averages—viz., for the male 45.37, and for the female 42.62; averages differing little from the standard, being 13-100ths less for the male, and nearly 66-100ths more for the female. So far, therefore, the enlargement of the basis of calculation increases the probability that the first results were near the truth, since 174 observations give in each sex, within a fraction, the same averages as the original dividend of 140. But the supposition that the difference between the estimate deducible from Dr. Sims's series of observations and mine, is owing to want of distinction of diseases which I have not attempted in summing up his weights for averages, seems to me clear, from this especially, that I find, as I shall hereafter state at length, that increase of weight is, in the encephalon,

an usual effect or concomitant of morbus cordis; that my averages for morbis corbis alone exceed those deduced from Dr. Sims's table for all diseases, and that my *gross* averages for all diseases are higher considerably than my *net* averages for various diseases, exclusive of phthisis and morbus cordis; the latter or *net* being, as already just stated, 45.37 for the male, and 42.62 for the female; whereas my averages, without distinction of disease, are, for the male 46.17, and for the female 42.95 (or nearly 43); and in each sex, therefore, very considerably higher than for the select class *varia*. But as I shall have occasion to return to this subject, I shall at present content myself by assuming the average for the brain, or encephalon, to be 45.37; or 45⅓ for the male, and 42.62, or 42⅔ for the female.

Cerebellum.—With respect to the cerebellum, of which, as not noticed separately from the brain or encephalon by Professor Tiedemann, or Dr. Sims, the average absolute weight for the males, excluding morbus cordis and phthisis, is, from 15 years upwards, 5 oz. and 2-100ths; and for the females, with like distinctions, 4 oz. and 5-10ths. This ratio between the sexes, of : : 10.9, is considerably different from that apparently found by Sir William Hamilton, whose statement is, that the cerebella of the sexes are nearly equal in absolute weight, but that the female cerebellum is rather the heavier. But he makes no mention of the absolute weight of the cerebellum, nor of the number of observations precisely, from which his conclusions are drawn.

Now, since the number of observations on which my conclusions are founded is at least three times as large as those at his disposal, on that account I think it not unreasonable to infer that he was misled by paucity of facts, and that he has either overrated the female, or underrated the male, so as to have obtained a ratio very different from the true one.[1]

Density of the brain, &c.—In another statement, however, of Sir W. Hamilton, I fully concur; I mean with regard to the density of the encephalon. Like him I have found little difference between the different parts of the encephalon; with this exception, however, that the density of the cerebellum usually exceeded considerably, as he also has remarked, that of the cerebrum.

In more than fifty observations at all ages, of both sexes, and of various diseases, I have met with but two or three instances in which the cerebrum exceeded or equaled in density the cerebellum. The average cerebral density for the males, I found by the first method (above described) to be 1056, to water as 1000; and for the females 1045; whereas in the cerebellum I found the proportions reversed, the male cerebellum being less dense than the female, the former being 1060.5, and the latter 1064.5. By the second method I obtained the following:— .

[1] I regret that while writing those observations on the cerebellum, I had not an opportunity of perusing Mr. Combe's recent work.

For the male brain	1031.33
For the male cerebellum	1037.25
For the female brain	1035.87
For the female cerebellum	1038.35

so that by this method, also, the female would seem to exceed in the density of the cerebellum; and in both sexes the cerebellum would appear to be denser than the cerebrum. Like Sir W. Hamilton, I have found as yet, by either method, no striking influence of age upon the density of the encephalon; one of the densest encephala I have met with having been that of a female eight years old, found dead in bed; and one of the least dense, that of a male of fifteen, dead of phthisis, a disease in which I usually find the encephalon amply developed. On the whole, it seems clear that the tendency to variation in nutrition and development in the encephalon is not eccentric only, as in the heart it would seem to be, but is also often concentric and condensing in its effects: a difference between the organs, owing probably to this—that the brain is not subject to the distensive forces that affect the heart's parietes, viz. the expansive efforts of the diastole, and the reaction of the fluids in the systole. The liability of the encephalon to abnormal condensation is well shown by the following recent observation:—A woman of seventy died of apoplexy, after an illness of some weeks. One hemisphere of the brain was observed to be normal, the other to be smooth and dry, with flattened convolutions. Under the floor of the ventricle, on the same side with the flattened convolutions, was a large clot that had burst into the ventricle, and pressed up the hemisphere apparently against the calvarium. The normal hemisphere, in this case, was found to be 1034.5, specific gravity: whereas the compressed hemisphere was 1338.5, showing an unequivocal cerebral condensation on the compressed side.

LUNGS AND ABDOMINAL VISCERA IN THE NORMAL STATE.

We next proceed to the lungs, and I am quite sensible of the difficulty of dealing with these organs in the same way as with the other. I have already alluded to the fact familiar to anatomists, viz., the unparalleled variability in density, volume, and absolute weight of those viscera. If it be attempted to bring them in some degree out of the field of mere empirical opinion, in which, in great part, they at present lie, into that of science, by the application to them of tests and processes, open to every understanding, whether *technically* instructed or not, we find ourselves immediately involved in opposite difficulties. If we choose density for our standard, we are at once embarrassed by similarity of results, with extreme diversity of organic conditions. The phthisical lung, the pleuro-pneumonic, the œdematous, and the extremely congested lung, will frequently exhibit like specific gravities, like densities, even in spite of considerable pains in preparation. If we take volume for our test, we are little better off than with density, for the œdema-

tous, the emphysematous, and the extensively tuberculated lung, and the lungs that have been extensively tumefied and consolidated by pneumonia, will often possess the same volume. Linear measurement is obviously open to all the objections almost already noted, or alluded to, and to some peculiar to itself; and weighing is, with respect to the lungs, exposed to sources of fallacy probably as numerous as any other mode of measurement. There are therefore great difficulties in the way of any attempt to bring within the pale of physical investigation, all or any part of the pathology of the lungs, above probably all the other organs. Yet the necessity of some precise knowledge of those physical characters of the normal lung, that admit of instrumental measurement, is clear; witness the writings of Ploucquet and others, on the *docimasia pulmonum hydrostatica*. This has been long felt in forensic practice, and in practical pathology it appears to me to be as desirable as any other branch of scientific medicine. With these feelings the lungs have been for some time included in the measurements by weight, already a considerable number of observations (130 to 140) have been collected, falling short, however, very much of a total capable of yielding trust-worthy results. Those observations, arranged according to age, sex, and disease, as the tables of hearts and encephala, give for the lungs the following results:—The class *varia* gives, as the average for life above fifteen, for the male, 46½ ounces, and for the female, 35½ ounces; the number of observations amounting to 31 for the males, and 34 for the females. These estimates are much less than those of Meckel, which are for both sexes apparently about 55 ounces.

Abdominal viscera.—With respect to the abdominal viscera, I shall now state shortly the number of observations, and the averages I have obtained for the whole of life above fifteen; and for each of them, in from 150 to 160 subjects, two thirds of whom nearly were females, and none of whom had phthisis or morbus cordis, nor any obvious morbid appearance of the viscera, implying unusual weight or density.

Table of Weights of the Abdominal Viscera for Life above Fifteen Years of Age, and excluding Phthisis and Morbus Cordis.

	Weights Avoirdupois.		Number of Observations.	
	Males.	Females.	Males.	Females.
Liver	49. nearly.	44.5	55	101
Spleen	4.75	4.33	50	93
Stomach	4.5	4.40	34	51
Kidneys	8.33	8.	55	98
Pancreas	2.25	2.25	51	84
Lungs	46.5	35.5	31	34

From the table it appears that this average weight of the normal liver may for the adult male be assumed to be about 3 lbs. avoirdupois, or a little more, and for the adult female about a quarter of a pound less, or $2\frac{3}{4}$ lbs.

The spleen appears to weigh, on the average, between 4 and 5 ounces, being in the table $4\frac{3}{4}$ for the adult male, and for the female $4\frac{1}{2}$ ounces avoirdupois. The stomach would seem to weigh the same in either sex nearly—viz. about $4\frac{1}{2}$ ounces. The kidneys average, for the adult male, something under $8\frac{1}{2}$ oz., or in the table $8\frac{1}{3}$ oz.; and for the female, the average appears pretty accurately to equal 8 oz.; and the pancreas seems of the same weight in either sex—viz. about $2\frac{1}{4}$ oz. Now the totals from which these averages have been deduced, are, for the liver, between 150 and 160, observations of which nearly two thirds were females. The spleen was examined in between 140 and 150 instances, and nearly two thirds were females. The stomach was weighed in from 80 to 90 cases, in which nearly three fifths were females. The kidneys in from 150 to 160 cases, of which something more than one third was male, and the pancreas in from 130 to 140 instances, of which a considerable majority was female. These totals are too considerable, it is imagined, not to yield averages approaching the truth pretty nearly. From these totals every case of unequivocal and obvious abdominal visceral hypertrophy, and morbid excess of whatever kind, were carefully excluded, as were all cases also whatsoever in which the lungs were phthisical, or the heart diseased.

By such sifting, the totals have been in several instances reduced to half the amount, and less, they would otherwise have reached; but the ends in view, viz. true averages, have, it is conceived, been more advanced by the selection of healthy viscera, than impeded by the diminution of the totals to be divided.

These numbers differ considerably from the averages of Meckel, which are, for the liver for both sexes and adult life, about $3\frac{1}{2}$ lbs. avoirdupois: for the spleen of adults of both sexes about half a pound: for the kidneys for both sexes about a quarter of a pound each, or about half a pound for both kidneys; and for the pancreas, something between $4\frac{1}{2}$ and $6\frac{1}{2}$ oz.

These estimates of the great anatomist, and accurate and excellent writer, Meckel, are however deduced from totals of which the amount is not stated, and in which there is further no statement of any adequate precautions having been taken to distinguish modifications of development produced by age, sex, disease, &c. I feel myself, therefore, at liberty to question the accuracy of the estimates of Meckel, where they differ much from my own, and to say that considering the number of observations, and the care taken in classification and selection on my part, there is reason to prefer my estimates to his, as approximations coming much nearer the truth. Respecting one organ only are we agreed, viz. the kidneys, regarding which our respective estimates are nearly identical. For all the

other viscera his averages are much too high. With respect to density, also, the results I have obtained seem to differ considerably from those announced by Professor Meckel. Density and specific gravity would seem practically to mean nearly the same. Density, to which I have principally directed my attention, signifying the quantity of matter in a given bulk of any substance under observation; and specific gravity, the gravitating force exerted by a known bulk of such substance in comparison with some other. The specific gravity and the density must be mutually proportionate, therefore, to each other. Meckel, however, announces the specific gravity of the liver to be 1500 and that of the spleen 1200, if I rightly guess, for there is some typical ambiguity in the text; and I have repeatedly found the liver to differ in weight from its own bulk of water by about 1-20th, and never, that I know of, in numerous trials, more than one 1-15th or 1-16th; which would give a density considerably under 1100, compared to water as 1000, and a specific weight still lower;—and I have as much reason to doubt the accuracy of his estimates of the specific gravity of the spleen as of the liver.

Having thus stated what I have judged necessary for my object, with regard to the physical characters of the viscera in their normal condition it becomes my duty to enter upon the second branch of my subject, or the abnormal conditions of the organs, in so far that it is susceptible of instrumental investigation and measurement, and in so far as such instrumental examination as has been instituted is calculated to throw any light on the causes and effects, signs and treatment, of cardiac disorders.

When we look at Albertini's work, *De Cordis Palpitationibus*, or Lancisi's work, *De Corde*, the one within the former half of the seventeenth, and the latter within the former half of the eighteenth centuries, and compare their semeiologies or ætiologies with those of any well informed physician of the present day, we at once perceive that great progress has been made since their times, and that more has been done for cardiac pathology within a few dozen recent years, than had been effected through all previous time. But much remains to be done, and the efforts of very many successive as well as cotemporaneous enquirers, working under various circumstances, and with various methods and instruments of investigation, will be required, to raise the science and management of cardiac disease to a degree of perfection equal to that of the least perfect of the physical sciences or mechanical arts.

Disease, as well as health, has many and various attributes and aspects, which are not all to be examined successfully by any one method, or test, or instrument. Of the means of which the pathologist may usefully avail himself, some are strictly anatomical and physiological, but these are not all; the instruments in use in

physical enquiries are many of them available in pathological investigations also. Amongst the rest, the balance is one of which I think too little use has been made, although an instrument that might be supposed to be of some utility, and is certainly of comparatively easy application. It is now some time since I first satisfied myself of its utility in observation, and of the extreme difficulty of accurate pathological investigation in numerous cases with the unaided touch and sight, and of the necessity of adding to our other means of examination, in certain organic diseases more especially, the mechanical means just named, for the purpose of correctly estimating the effects of disease upon the viscera, in influencing the mode and degree of their nutrition. The College will judge how far I have reasoned correctly, or have been deceived on the subject. I now proceed to state the results of my observations.

DEVELOPMENT, &c. OF THE DISEASED HEART.

The heart itself, of course, claims the first notice. Since I began to employ the balance, &c. in post mortem examinations, I have had opportunity of inspecting the remains of from 170 to 180 cardiac subjects, dead of morbus cordis in most instances, of course, but in a considerable number of cases dead of other diseases, of which diseased heart was a cause or else a complication. These are from amongst a much larger number who have come under my notice within a few years, principally in official practice. Of these the majority—the great majority, indeed, but I cannot say the exact proportion—had suffered during life from symptoms by which they could easily be, by any experienced pathologist, recognised as examples of morbus cordis; but several died without its having been known before their deaths that there was any organic affection of the heart involved in their complaints. Some of the latter had been brought in moribund, others had had their cardiac symptoms masked by mania, or by typhus, or by phthisis with delirium, or by spasmodic cholera, or by universal bronchitis with emphysema pulmonum, otherwise vesicular dilatation, with bronchial hypertrophy; and there were also some examples of violent pleuro-pneumonia in advanced stages, by which morbus cordis was masked, until the cases were hopeless, or even until death. Of the 170 to 180 cases, two thirds almost exactly were males, and one third only females. Thirty were cases of well marked valvular disease, combined with obvious hypertrophy in almost every case; and the remainder, or nearly five sixths, were cases of simple hypertrophy, without pericarditis or endo-carditis, or unequivocal valvular deficiency or disease.

The diagnostication of the hypertrophy was, as is usual, easy in most cases. The unaided touch or sight was often sufficient to show that the volume and weight of the organs, and thickness of their walls, were abnormal. Where decided valvular deficiency or disease existed, of course the evidence of morbus cordis was

obvious. But in none of the cases could *the degree* of hypertrophy be correctly estimated without measurement, whether linear, or by volume, or by weight. In a very considerable proportion of them no observer could, without such aid, affirm that the excess of weight or volume was slight, considerable, or extreme, upon any better or less equivocal ground than his own private conviction; and in several cases in which considerable hypertrophy existed, the heart being found to weigh 11 to 12 oz. or more, in persons of common size, it was at first conceived, *judging by the touch and sight*, that the heart was normal.

One case particularly struck me. It was that of a person whom I had known for some years during life, and who for many years had been short-winded, and what is popularly called asthmatic. This man had had influenza during the last great epidemic, and had not completely recovered, when he over-exerted himself by carrying a weighty parcel, and was immediately attacked with violent dyspnœa, with extreme anxiety, and some pneumonic symptoms, and sank within a week. The heart of this man was pronounced normal by several spectators familiar with pathological anatomy, and appeared to myself much less than from his history I should have expected. When placed in the balance, it was found materially to exceed the limits of health, his size, sex, age, and every other circumstance duly considered. It weighed 11 ounces avoirdupois, and was, of course, in bulk as measured in water, some drams less.

In nearly all the cases there was more or less hypertrophy, often on both sides, but almost always in the left ventricle at least. The exceptions, amounting to two or three per cent. of the 170-80, were mostly wasted females advanced in life, and dead of valvular disease. The average weight of about eighty male hearts, taken without selection on account of weight, was about 15 ounces avoirdupois, instead of 9 ounces, the normal weight for adults above fifteen years, or an increase of substance of two fifths, or 40 per cent., and the female average on forty to fifty specimens was about 13 ounces, or 38½ per cent. increase, or nearly the same proportional increase as in the male cases. In no instance of morbus cordis, whether including valvular disease or not, have I observed any diminution of the heart in weight or volume below the normal proportions above stated, not even of such as were wasted by phthisis, antiphlogistic remedies, long suffering, &c.

Complications of morbus cordis.—In almost no instance in which the heart was known, during life, to be diseased, or was the subject of just suspicion, do I find that the heart alone was in a morbid state. On the contrary, complication with diseases of other organs was the rule, to which the exceptions bore a very small proportion indeed, limited nearly to cases of persons cut short suddenly by accidents, and mostly of no advanced ages. The complicating diseases were numerous, principally inflammatory, often acute, more frequently chronic; and these complications bore as large a propor-

tion to the uncomplicated cases in the 140-50 instances of simple hypertrophy, very nearly, as in the thirty cases of decided valvular disease. In each class the complications were of the same nature likewise. No marked difference was observed between them, except that, on the whole, there was, during life, more pectoral distress in the class of cases involving valvular disease, and disease of the orifices,—which latter by the way, when real, and not an accident depending on the state of the contractile energy immediately preceding and attending death, usually, I conceive, implies the former or valvular disease. Also, that the tendency to diffused dropsy, including all the cavities nearly, as well as the cellular substance of the lungs and lower extremities, and also the pulmonary vesicles, was greater on the whole in the class Valvular Disease. The particulars of the well-marked complications ascertained post mortem, were as follows;—

Of the cases of simple hypertrophy,

23 had phthisis.
29 — pleuritis.
36 — pneumonia and pleuro-pneumonia.
22 — pericarditis.
6 — mania.
23 — various other diseases; amounting together to 14, viz.

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typhus, delirium tremens, influenza, metritis, peritonitis, cholera, rubeola, morb. cerul., erysipelas, diarrhœa, quotidian, hemorrhages, aneurism, and mors subit. Besides the above 139, fifteen had apoplexy, viz. nine males and six females, out of a total of 34 cases of apoplexy, or nearly three sevenths or 42 per cent. of all the cases of apoplexy examined. Of the remaining four sevenths, six were males, of whose hearts two were not examined, and thirteeen were females, of whom four were doubtful for the same reason.

The general total of complications of morbus cordis was then 154, exclusive of bronchitis, and exclusive also of several instances of morb. chron. cerebri—such as comatose, epileptic, and fatuous cases of long standing; also cases of softening (ramollissement) of the brain in advanced years; none of which are included above. Of the whole number of cases, a small fractional part only were free from chronic bronchial disease, in the shape of bronchial injection and hypertrophy, with vesicular dilatation. A majority had likewise œdema pulmonum, and a large proportion had serous effusions, or dropsy. In five sixths to six sevenths, or between eighty and ninety per cent., there was enlargement of all or several of the viscera; the lungs included, which were generally considerably denser and heavier than normal. In all these respects there was little if any difference between those cases of simple hypertrophy and those other cases in which the valves were implicated.

The following tables give the average weights of the viscera in the classes *Varia* and *Morbus Cordis*, according to the age and sex:

Table of Weight of Viscera according to Age and Sex.

VARIA.

	15 to 30.		30 to 50.		50 to 70.		70 to 100		No. of Obs.	
	M.	F.	M.	F.	M.	F.	M.	F.	M.	F.
Lungs . . .	38	33½	50	35	56¾	36	41	38¼	31	34
Liver . . .	55	55⅔	49	47	49⅓	40⅔	41⅔	35	55	101
Spleen . . .	5	5	4½	5	4½	4	5	3½	50	93
Stomach . .	5	4⅔	5	4½	4⅓	4.1	4	4⅓	34	51
Kidneys . .	8¼	9½	9	8⅔	8¼	7½	8	6⅓	55	98
Pancreas . .	3	2⅓	2½	2⅓	2½	2 1-6	1⅔	2 1-5	51	84
Encephalon .	49.33	42.17	43.5	42.5	45.8	42.75	47	39.9		

Table of Viscera according to Age and Sex.

MORBUS CORDIS.

	MALES.				FEMALES.			
	15 to 30.	30 to 50.	50 to 70.	70 to 100.	15 to 30.	30 to 50.	50 to 70.	70 to 100.
Encephalon	50.75	49.66	47.1	41.5	. .	44.5	45.8	40.5.
Cerebellum	4.5	5.5	5.12	4.7	. .	4.75	5.25	4.25
Lungs	47.5	59.	56.5	59.	33.	32.	41.	35.
Liver	66.5	63.25	51.5	48.5	59.	54.	50.25	40.5
Spleen	7.	8.25	5.17	4.33	7.5	5.75	5.5	4.
Stomach	5.25	5.5	5.5	5.5	5.5	5.	4.75	5.33
Kidneys	11.25	11.25	9.5	8.33	10.5	10.	8.5	8.
Pancreas	3.	3.2	3.	3.11	2.5	3.25	2.25	2.38

From these tables, which are founded on totals which are in most cases considerable, and include several scores of separate observations, it would appear that in morbus cordis there is an increase in the volume and weight of every single viscus, as compared with the standard of the class *Varia*, (with the exception of the male cerebellum,) on the whole of life, and in each subdivision of the four in each table—viz. from 15 to 100, and from 15 to 30, 30 to 50, 50 to 70, and 70 to 100. The average, in fact, in nearly every observation is considerably above the standard in the case of every viscus. The encephalon, if we take the first column, or the interval, 15 to 30, gives for the male $50\frac{3}{4}$ or 3lbs. 2^3 oz. avoirdupois, instead of $49\frac{1}{2}$, or 3 lbs. $1\frac{1}{3}$ oz.; being an excess over the normal dimensions of nearly one thirty-third part. The lungs, in like manner, are found to exceed by about one fifth: the liver by about one eleventh; the spleen by two sevenths; the stomach by one twentieth; the kidneys by about one fourth. Then, in the second column, for the interval 30 to 50, the encephalon exceeds the normal standard by more than one eighth; the lungs by nearly one fifth; the liver by more than one fifth; the spleen by one half; the stomach by more than one twentieth; the kidneys by more than one fifth; and the pancreas by more than one sixth. In the third column the encephalon is less than in the second, as there it was less than in

the first; but it is still one thirty-fifth in excess, at least; while the lungs are about the same weight: but the liver is larger by more than one fifth; the stomach by one fifth; the kidneys by one ninth; the pancreas by one sixth; and so on of the rest. And in every column, in like manner, the female portion of the table gives the same or a similar excess of the viscera above the normal standard; whilst, on both sides of the table, and in the case of every organ, the life averages for morbus cordis exceed those for other diseases not complicated with disease of the heart. The averages for the two classes for life are as follows:—

Encephalon.

	Males.	Females.
Varia,	45.33	42.62
Morbus cordis,	47.25	43.60

	Male Varia.	M. Morb. Cordis.		Fem. Varia.	Fem. Morb. Cordis.
Lungs,	46.5	55.5	Lungs,	35.5	36.
Liver,	49.	57.	Liver,	44.5	50.75
Spleen,	4.75	6.12	Spleen,	4.33	5.5
Stomach,	4.5	5.40	Stomach,	4.40	5.12
Kidneys,	8.33	10.	Kidneys,	8.	9.25
Pancreas,	2.25	3.	Pancreas,	2.25	2.5

Since then, the general averages, and not those only, but also the sub-averages or quotients of the different ages of each sex respectively, differ so decidedly, it seems difficult to avoid the conclusion, that in morbus cordis there is usually a considerable increase of volume and weight in the viscera of all the cavities: and indeed, to judge by my own opportunities, I should say that there cannot be a doubt that the enlargement of several of the abdominal viscera remarked by several authors, and usually referred to congestion of blood in the capillaries, owing to reflux, real or imaginary, from the heart, is a substantive, and not an apparent hypertrophy only. After first observing the frequency of such visceral enlargements, I constantly incised every viscus before weighing it, until I satisfied myself that the conjectural explanation founded on supposed reflux and stasis of the blood, would not meet the facts, and that, in addition to occasional or even frequent and considerable congestion, there must be excess of deposition of assimilated fluids, otherwise excessive nutrition. But latterly the encephalon, heart, lungs, and stomach, have been the only organs uniformly incised; and, saving the heart and stomach, and occasionally the lungs also, I have not observed the weight of any viscus to be materially altered by incision, which, however, they could not fail to be if any considerable portion of their volume or weight depended on congested fluids.

Additional Considerations.—Now as the question, as to whether morbus cordis is ordinarily attended by general visceral enlargement or not, and is itself directly or indirectly either the cause or the effect of such enlargements and hypertrophies or not, is a question of some importance in several respects, it seems fitting that I

should here state any additional facts or considerations that may be at my disposal, in confirmation of the view I take of the subject.

To begin with the encephalon. One fact is this, that of 58 of the 520·30 cases, in which the encephalon weighed 50 oz. and upwards, and of which 53 were males, and 5 females, 33 were known cases of morbus cordis, or more than 61 per cent.; and of six or eight, it is uncertain whether the heart was hypertrophous or not. This coincidence of excessive volume in the brain and heart in so large a proportion of cases, is not easily reconciled with any other supposition than that which I have adopted, viz. that the encephalic augmentation is an effect in some way of the cardiac disease. This conclusion derives partial support from Dr. Sims's paper. Of his cases, 37 were of 50 oz. and upwards of encephalic weight, and of those most had died either of morbus cordis, or dropsy, or apoplexy, or phthisis, or pneumonia, and were, some certainly, others probably, complicated with more or less hypertrophy, more especially of the left ventricle.

Another fact is the connection long since remarked by Albertini, I think, and above exemplified, (p. 595, c. 1), between apoplexy and morbus cordis, and which has been exemplified also, it is said, in the persons of several eminent medical professors: of Malpighi, and, if my memory rightly serves me, of Lancisi, of Corvisart, of Cabanis, of Ramazzini, of Parry, and others; and of many lay persons of consideration; one of our British kings of the Hanoverian line being amongst the number. Sudden arrest of action in an organ naturally of the most delicate susceptibility, when in a plethoric condition, is no more singular than sudden increase of activity. These extreme fluctuations are common in all functions depending essentially on vital properties and dynamic conditions; and seated in organs over stimulated and over nourished. Sudden arrests of the action of the hypertrophous heart is one of the ordinary forms of death in morbus cordis. Syncope, another form of suspended action, or at least diminished action, is another frequent incident in the course of cardiac disease. Assuming, therefore, the hypertrophy of the brain in those individuals, I can easily understand the occurrence of apoplexy. If cerebral pressure be the true cause of apoplexy, or even supposing it the commonest exciting cause only, which appears to me the more reasonable supposition of the two, it is easily understood that a moderate transitory congestion, or sudden afflux of the blood, may, in a too voluminous encephalon, excite an apoplectic seizure. It is likewise very obvious that, to persons advanced in life, as were Malpighi, George the Second, &c., in whom induration and fragility may have commenced in the cerebral arteries, a very moderate accumulation of blood may be attended by cerebral hemorrhage.

Observations of authors.—Then, with regard to the other viscera, it is well known that numerous pathological writers have recorded instances of enlargement of induration, and other morbid changes of several of the viscera, in connection with morbus cor-

dis. With respect to the lungs, for example, Lancisi states, that in his experience aneurism of the aorta (which I find invariably accompanied by hypertrophy of the heart) had often caused suffocation, asthma, hydrothorax, and other pectoral symptoms, commonly referred to other viscera.—(1740, p. 284.) Lancisi also attributes aneurism of the heart to asthma and chronic catarrh, showing thus that he was aware of a connection between pulmonic diseases and morbus cordis. Senac adds, phthisis and pneumonia, (L. 6, C. 8, S. 4.) Corvisart speaks of induration and engorgement of the lungs, attending morbus cordis as an effect of it. (By Hebb., p. 388.) Dr. Bree quotes from Morgagni, and other authors, several cases of asthmatics, whose lungs were found charged with fluids, and which were probably cases of chronic catarrh, with morbus cordis. In several, he mentions the lungs were firm and heavy. In all, the symptoms were those of the bronchitis of advanced years, which, as Andral has well remarked, usually depends on, or is connected with, enlargement of the heart. He remarks, as it were in confirmation of that supposition, that, in his opinion, and those of numerous authors, the spasmodic asthma is more common in males than in females, which is just what must happen if asthma be always dependent on, or connected with, disease of the heart; as, along with Kreyssig and several excellent French pathologists, I believe it to be. Lieutaud gives, in his great collection, numbers of cases of heart disease, certain or probable, in which the lungs were also diseased, viz.—emphysematous, œdematous, inflamed, &c., especially in his second book, sections 2, 5, 6, 7, 9, 12, 14, 15, 16, in each of which cases are given in which the heart appears to have been diseased in connection with grave pulmonary disorder, as adhesions of the lungs, sect. 5—emphysema, sect. 6—infarction, sect. 7—inflammation, sect. 9—pulmones purulenti, sect. 12—ulcus pulmonum, sect. 14—pulmones præduri et schirrosi, sect. 15—pulmones tuberculosi, sect. 16—and in the two following, several cases are given in which cardiac symptoms with pulmonic were mingled during life; and in several of which, though disease of heart is omitted, because probably overlooked, enlargements, indurations, &c. of lungs, liver, spleen, &c. are mentioned. In his second volume, from observations 407 to 441, numerous cases in point are cited. Observations 613 to 652 have most of these pectoral symptoms, cardiac and pulmonic, and many morbid appearances in each organ. The observations 701, 705, 847, 861, present similar combinations of pectoral symptoms and appearances. In like manner, in his chapter "De Colluvie Serosâ," numerous observations illustrate the pathological connection between the two great organs of the organic life; and though the heart is not mentioned in several, yet morbus cordis appears to have existed, and produced visceral indurations, congestions and enlargements. Dr. Hastings has a chapter, in his History of Bronchitis, "On dropsy dependent on bronchitis;" and in his description of the disease, he enumerates "constriction across the chest, as if

by a ligature; violet colour of the lips; lividity of the face; anxiety and uneasiness referred to the heart; palpitations; extension of the heart's action beyond normal limits; pulsation in epigastrio; an undulating motion of the heart during the action of the ventricle; irregularity of the pulse; dulness on percussion on the left thorax;" amongst the symptoms. He adds, that it is common in old people who have had chronic cough for years, and much expectoration; common also in spirit-drinkers in the decline of life; the heart in such cases being generally enlarged, and sometimes adherent. He attributes the enlargement of the heart to extension of disease from the bronchia. Notwithstanding all this equivocal ætiology, there is abundant evidence of a knowledge of pulmonic disease in connection with diseased heart. In the third volume of the Clinique Médicale, we are informed that when chronic bronchitis is accompanied with much oppression, it is in that case complicated with morbus cordis; the disease of the heart being often prior in date, but sometimes being posterior to the bronchitis, and an effect of it and the dyspnœa which it occasions.

Such are some of the principal particulars that I meet with in authors confirmatory of the connection I have represented as nearly constant between pulmonic and chronic cardiac disease. Had the practice of slitting open the bronchia in *post mortem* examinations, with a view to inspect the inner surface of the bronchial ramifications, and to ascertain the condition of the parietes of the air-tubules and air-vesicles, been more common, I cannot doubt that I should readily find much more precise information on the subject of the connection between the lungs and heart in disease.

But the evidences respecting the connection of abdominal visceral enlargements with morbus cordis found scattered over authors, are much more numerous and precise than those that relate to pulmonic complications of morbus cordis.

Lieutaud has been already cited as noticing the existence of abdominal visceral enlargements in connection with diseases of the heart: that he does in numberless places, many of which have been already referred to. Senac states, that what he calls "engorgement," by which I understand apparent enlargement and real hypertrophy, is a frequent, though (then) little known consequence of dilatation of the heart. Corvisart points out "engorgement of the liver with tenderness" as an occasional source of error in diagnosis, (an observation I have had myself frequent opportunities of verifying); but the large liver is common in one degree or another in all heart cases, owing, he thinks, to regurgitation. Dr. Bree mentions enlargement of the liver as common in connection with enlarged heart, and as a cause of asthma. Dr. Hastings remarks the connection between the bronchitis of the drunkard and enlargement of the liver, and ascribes the thoracic disorder to the extension of the hepatic irritation to the lungs. But Portal gives the most information respecting the morbific powers of the liver, of such authors as I have had opportunity of consulting. He ascribes the

symptoms of steno-cardia to disease of the liver, including the stricture of the chest, and spasms of the diaphragm, also the numbness of the arms, risus sardonicus, palpitations, syncopes, and every other symptom of angina pectoris. He states that numerous observers have found hepatic enlargement to attend steno-cardia, and says that pains truly hepatic are often referred to the heart, and various other organs, which he enumerates. He adds, however, that obstructed circulation through the heart is a frequent cause of hepatic disease, and that in such cases the heart is usually found enormously enlarged. But whatever may be thought of Portal's opinions, his facts are valuable. In the second part of his work on the Liver, he gives, in the eleventh article, eleven cases in which the liver was found enlarged, dyspnœa, &c. having existed during life, and in two or three of which traces of pulmonic and cardiac disease are noted. In his twelfth article, he gives eight cases of palpitations and syncope from steno-cardia, depending, he conceived, on hepatic disease. In all the eight, the liver was found enlarged after death; and nearly all were observed to have enlargement of the heart, and other pectoral disease. Many recent writers in Britain and France have noticed the connection of abdominal visceral enlargement, more particularly hepatic, with cardiac disease. The writings of Doctors Bouillaud, Lobstein, Abercrombie, Hope, Latham, Bright, Andral, Copland, and others, contain distinct statements to that effect, and many examples. The work of Professor Bouillaud, "Du Cœur," contains more examples of abdominal visceral enlargement than any recent writer that I know of. For examples, vide Cases 21, 23, and 24. Observations 43, 51, 53, 57, 60, 61, 62, 63, 68, 69, 72, 119, 121, 125, 129, 130, and 132: in all of which the heart was of course diseased, and the liver is recorded as enlarged, and in several instances other abdominal viscera also. In Lobstein's Pathology, in the article "on the Heart," there are three cases at least in which the coincidence between cardiac and hepatic enlargement is noted. Dr. Abercrombie has mention of the fact just referred to in three of his cases in his paper in the Edin. Med. Chir. Trans.; viz. Cases vii. x. and xi. Dr. Hope records the pathological connection under consideration, in several of his cases, as in C. iii. ix. xv. xxii. in his work on the Heart. Dr. Bright mentions in his valuable Medical Reports, that in several cases the coincidence between pectoral and abdominal hypertrophous disease, so far at least as the liver and heart are concerned, was observed by him. For examples, see his 7th, 22d, and 24th cases. Dr. Latham informs us in his instructive lectures delivered in this place, and published in the Medical Gazette, vol. iii. that he is familiar with the occurrence of enlargement of the abdominal viscera as a complication or effect of morbus cordis; and he specifies the liver, kidneys, and spleen, as the organs most liable to hypertrophy under those circumstances. Dr. Copland mentions the enlargement of the abdominal glands, as according to his observation a common complication of heart disease, in his articles

"Asthma," "Disease of the Heart," &c., in his well-known and admirable digest of professional opinion and experience. Vide p. 94.

The opinions of the authors just quoted, are by no means in harmony on every point, and vary especially, I think, on the subject of ætiology. But to the fact of the occasional connections so often named, they clearly all bear witness, more or less decidedly.

The acquaintance of German pathologists with abdominal and pulmonic complications of morbus cordis, is evinced by Kreyssig, who speaks at length about it in his sixth chapter; while Testa, speaking we may suppose for Italy, assures in his eighth chapter, that in most bodies of cardiacs he has found the liver enlarged and elevated above its normal situation, so as sometimes even to surpass the third rib.

In fact, there is no organ that I have examined, respecting which I have not met several notices in preceding accounts, excepting the stomach, the encephalon, and the cerebellum, which have not been, so far as I know, examined with views similar to mine; and the pancreas, of which, as enlarged in morbus cordis, however, I have seen some notice, I think, in *post mortem* reports, to which I have mislaid my references.

Summary conclusion.—It may then, I think, fairly be assumed that visceral hypertrophy and enlargements are usual attendants of morbus cordis in every cavity; and that if there are exceptional cases (and how should there be a rule in physiology, mordid or healthy, without exceptions?) such cases constitute but a small fraction of the sum total of cases of diseased heart, and confirm that rule, of the truth of which they are part of the evidence.

Deductions from foregoing observations.—Having thus given a summary view of some of the principal results of more than five hundred post mortem examinations of persons above puberty, and without selection of cases, I proceed shortly to state such observations as may be suggested by the facts related, as throwing light upon the diseases of the heart; and before entering on any particulars of this second part of my enquiry, I would make one or two general explanatory remarks, in order to avoid the necessity of interjecting any thing personal to myself into the body of the argument.

Preliminary observations.—Practical medicine is to be cultivated, not by one method only, but by several. The principal are *the natural history method*, and the *numerical method;* which latter might also be called the empirical or statistical method. The former necessarily precedes the latter. To examine, classify, and describe objects—diseases or morbid changes, for example—is the first step in all scientific medicine; and beyond this first step little progress has as yet been made in the science. But when the enumeration and description of the genera, species, and varieties of the causes, signs, effects, and remedies of diseases are completed, practical medicine is only begun; for a second and more difficult

step remains to be accomplished, which is, for all social and technical purposes, as necessary as the first, and has for its end the fixing with precision the relative practical value and importance of the objects examined and classified, by ascertaining for each respectively the order and frequency of its occurrence, and the extent of its distribution, and the limits of its power and duration; and thus accurately defining the preponderant tendencies of each, in its relations to life and health. This step is made principally by the aid of numbers, without some aid from which, direct or indirect, it cannot well be done at all. A small or little varied experience may, perhaps, be correctly estimated by the rude informal arithmetic of recollection or memory. But in dealing with facts, numerous and complicated, memory is unworthy of confidence. From neglect of this in great part, no doubt, it is that the writings of many practical authors, especially the older authors, are so deficient in materials of rigorous proof or disproof; and might be justly entitled "Popular Essays," or "Magisterial Discourses on Medical Subjects," rather than contributions to practical science. Now, however, there is happily a better spirit abroad, and facts are more skillfully observed and more accurately recorded. But something still remains to be done, and more especially in the way of improvement of the means of observation; and the use of instruments of various kinds has as yet, I apprehend, been too much neglected. Partly owing to imperfections from this cause, in various works I have consulted, and partly owing to some peculiarity in the means of examination I have employed, I have been obliged to limit myself too exclusively to my own papers, for precise facts upon which to reason; and I think it advisable to mention this beforehand, lest, from not referring so much as I should like, or might be expected to do, to authors, I should be suspected of an indolence that had found reading laborious, or of a vanity capable of fancying it to be unnecessary.

STATISTICS OF MORBUS CORDIS.

Distribution or frequency, according to sex and age.—The first topic that offers itself for observation under this head, is the relative frequency of morbus cordis, as compared with other grave diseases of a character sufficiently defined for numerical comparison.

As already hinted, the facts and figures laid before the college in the foregoing observations, are some of the principal results of above 500 autopsies made within a limited period. Of these, above half were cases included in the class *Varia*, or diseases of various classes and kinds, exclusive of pulmonary consumption and disease of the heart. Of the remainder, between 70 and 80 above puberty were cases of consumption, of which two thirds were males above puberty; and the rest were cases of disease of the heat, of which

likewise two thirds nearly were adult males. The number, then, of cases in which the heart was diseased, occurring in a total of 520 to 530 inspections, was 170–80, or about 33 per cent.; and if we deduct from the total number of autopsies the cases of persons under puberty or fifteen years of age, amongst whom but two or three cases of diseased heart were observed, we shall then have as the ratio of disease of the heart to the whole number, about 35 per cent. Unquestionably such a ratio is enormous; exceeding by far the calculation of those most disposed to estimate highly the mortality attributable to the heart; yet I have myself but little doubt that, with some explanation, the following table (which, it will be observed, understates the case) will be found less extravagant than it may perhaps at first appear:—

Table deduced from Table 1, (*Table of Hearts*) *to show the Ratio of Phthisis and Morbus Cordis at each Interval of Age, to the whole of the Cases included in each Interval of Age.*[1]

	MALES.				FEMALES.			
	Phthisis.	Morb. Cord.	Ph.	M. Cor.	Phthisis.	Morb. Cord.	Ph.	M. Cor.
	Cases.	*Cases.*	*Per Centage.*		*Cases.*	*Cases.*	*Per Centage.*	
15 to 30	11 in 24	5 in 24	45	21	8 in 33	5 in 33	24	15
30 to 50	19 in 67	24 in 67	28	36	8 in 47	8 in 47	17	17
50 to 70	17 in 84	34 in 84	20	40.5	9 in 55	16 in 55	16.4	29
70 to 100	3 in 31	13 in 31	10	42	2 in 39	13 in 39	5	33.33

The principal explanatory remark I think it necessary to offer, is this, viz., my principal field of observation receives all poor applicants from a certain district, provided only their complaints are severe, making no distinction as to sex, age, or disease, except small-pox, nor between curable and incurable cases, and in general entertaining all the latter until the end of life, unless the sufferers voluntarily withdraw. The effect of this system of admission is, that, compared with other asyla of sickness, the parochial infirmary, so governed, has, according to well known laws of mortality, an annual loss of life much exceeding that of county infirmaries and city hospitals—a mortality, it is to be remembered, that is augmented very considerably by accessions of cases dismissed from other charities as incurable. For the effect of this comparatively indiscriminate admission, and unlimited retention of patients, of course a large allowance must be made. What the exact amount of that allowance should be, I am not prepared to say; but if it be assumed at the immense proportion of 50 per cent. of the fatal adult cases, which I am quite sure is much over the mark, we shall still have

[1] The heart table contains no case of valvular disease, nor more than four fifths of the simple hypertrophies.

a ratio of heart disease for which probably few of my hearers will be prepared.

Ratio of phthisis to other diseases, according to authors.—The extravagance of the ratio will probably appear still greater when we compare the amount of cases of phthisis with that of morbus cordis. Phthisis, or tubercular pulmonary disease, is, and has long been held by pathologists and medical statists to be by far the more frequent of the diseases of these and all other temperate climes. The accomplished Dr. Young, writing in 1815, attributed to phthisis, as Heberden, Woolcombe, Wells, &c. had previously done, full 25 per cent. of the whole mortality of England. He begins his remarkable work on Consumptive Diseases thus :—"Consumption is, in almost all civilised countries, the most extensively and inevitably fatal of diseases." And elsewhere (p. 41) he says :—"The frequency of consumption in Great Britain is usually such that it carries off about one fourth of its inhabitants. At Paris the mortality by consumption has been estimated at one fifth, and at Vienna it is said to be one sixth of the whole. But the mortalities at Paris, and in the south of France, from consumption, have frequently amounted to one fourth of the whole." And seven years previously to the publication of Dr. Young's work, Dr. Woolcombe, of Plymouth, calculated that the annual mortality in England from consumption alone, amounted then to 55,800 persons.[1] And Sir James Clark's estimate is apparently higher than Dr. Young's, being for the 121 years ending with 1821, as follows :—

For the year 1700	the deaths from consumption were to all the deaths of the year	.145
1700 to 1750		.214
1750 — 1801		.263
1801 — 1811		.288
1811 — 1821		.316
General average for the 121 years		.245

or 1 in 4; and he adds, "It now appears (1835) to constitute one third of the whole mortality."

The difference between my own conclusions and those of the distinguished authors just referred to—conclusions in which they are supported by the principal recent writers on the subject, as Benoiston de Chateauneuf, and Lombard, &c. will seem the more wide and irreconcileable for this reason: Drs. Woolcombe and Young, as is well known, wrote at a time when the name of phthisis or pulmonary consumption was extended to other pulmonary affections besides that to which it has been limited by Sir J. Clark, Dr. Lombard, and other writers who have published since the appearance of Laennec's great work; so that if, before 1819, tubercular consumption was the cause of but part of the twenty per

[1] Remarks, &c. p. 73.

cent. of popular mortality, attributed justly enough to chronic pectoral, and most pulmonary disorders, then, on that supposition, the proportion of deaths referable to pulmonary consumption in the old and looser sense is now much increased, since the present mortality from true phthisis, in the stricter sense of Laennec, is held by the high authorities above named to amount to one in five, or thereabouts, being the same per centage of mortality as was previously attributed to several chronic pectoral affections of which true phthisis constituted but one, though no doubt a principal species.

Now the doctrine maintained by Young is true, although, for practical purposes, perhaps, it is obsolete. In addition to the facts advanced by that very learned writer, in support of his opinion, others concur in the same conclusion; amongst the rest this hitherto unpublished observation.

Between May 1821 and May 1835, there were recorded in the journals of the Marylebone Infirmary, under twenty-six principal heads of disease, nearly 4000 (3990) deaths, viz.:—

1. Encephalic diseases, amounting together to 489:—		
Apoplexy,		182
Paralysis,		165
Convulsions,		50
Phrenitic cases,		71
Tetanus,		5
Epilepsy,		16
2. Pectoral diseases, amounting to about 2300, viz.:—		
Phthisis,		991
Asthma,	733	1115
Morbus cordis, dropsy, and hydrothorax,	382	
Inflammation of lungs and pleura,		208
3. Abdominal diseases, 732, viz.:—		
Cholera,		102
Inflammation of bowels,		65
Chronic disease of liver,		59
" " stomaah,		16
" " kidneys and bladder,		29
Dysentery,		204
Tabes (infantum),		257
4. Pyrexiæ—Continued fevers,		237
Exanthemata,		70
Erysipelas,		43
5. Scrofula (42), and old age (57); together,		99
		3990

In addition to the preceding there were about 400 other deaths from minor sources of mortality, making with the former nearly 4400 deaths in the period. Now of the total 4400, as already stated, nearly 1000 (viz. 542 males, and 449 females) were deaths from phthisis, understood in the larger sense of the word, as used

by Dr. Young, which gives a per centage of 22½ on the whole mortality of the fourteen years. This observation fully bears out Dr. Young's estimate, as well as those of Drs. Wells, Woolcombe, and Heberden, and other English estimates anterior to 1819.

Such estimates questionable.—But the limitation of the term Phthisis, or P'thisis, by Laennec, to tubercular phthisis, on account of its superior fatality and more extensive distribution, as compared with other chronic and strictly pulmonary disease, while it has narrowed the field and rendered more precise the objects, has, at the same time, made more difficult the means of enquiry. And at the present time it is difficult to place confidence in any results not obtained by diagnosticians of unusual skill during life, or by careful post mortem examinations by practised pathologists. So that admitting the general correctness of Woolcombe, Young, &c., I am much less disposed to coincide in the views of the medical statists that have written subsequently to the general promulgation of the discoveries of Avenbrugger and Laennec, in the great work of the latter. There is much reason, in truth, (and with the highest respect for the very able and distinguished writers above named, I say it,) to suspect the data on which their calculations were founded. How small a proportion, in fact, of the mortality included in those estimates has arisen from disorders proved strictly phthisical or even pulmonary, by competent diagnosticians during life, or by proper inspection post mortem! For my part, I have no doubt at all that the greater part of the so-called pulmonary consumptions in persons above thirty years of age, have been in reality mere chronic catarrh, complicated with hypertrophy of the heart and air tubes. But whatever may be thought on that point as a general position, it is very certain that the proportion of morbus cordis included in the 520, and odd cases so often referred to, much exceeds that of phthisis. The cases of heart disease amounted to 170, to speak in round numbers, and those of phthisis to less than half, or about 80. Now this difference has not been caused by any selection at admission, or at the time of post mortem inspection. Every proper case was admitted on application; and every case that proved fatal, and for which permission could be obtained, was examined without distinction of disease. That it was not mere accident, seems probable from the fact, that in the case of either sex the preponderance was in favour of heart disease. In the case of the males the ratio of phthisis to morbus cordis was as two to three; and in that of the females it was as nearly six to seven. I confess it seems to me more probable that the difference between the generally received proportion of disease of the heart to other diseases, especially phthisis, and that obtained by myself, is owing to this, viz. that on the one side the diagnosis has been, in a large proportion of cases, conjectural during life; while, after death, no sufficient examination has been made; and that on the other side the diagnosis has been always based on instrumental as well as anatomical examination. This, I say, seems more probable

than that the result at which I have arrived, with the aid of unusual facilities and precautions, should be so far wide of the truth as to represent a disease that really amounted to one fifth of the whole fatal disease of the country, as one half less frequent, even in a single district, than another disease, of supposed comparatively rare occurrence. Whatever, also, it is to be noticed, may be the effect of indiscriminate admission and protracted residence, it is common to both diseases, so far as my observations are concerned, and cannot be supposed to affect the ratio. So that on the whole, when I recollect the numerous diagnostic errors into which I have myself fallen, in pectoral diseases, and those I have known committed by other practitioners, and call to mind the difficulty in general of accurate diagnosis in the same class of disorders; remembering also the recency of the promulgation of the invaluable mechanical semeiology of Avenbrugger and Laennec, and the confusion not yet sufficiently remedied, of several distinct diseases, commonly classed under the one name of *Consumption*, or *Decay*, and its synonymes, viz. :—1. Chronic bronchitis, occurring in scrofulous and cachectic subjects, with loss of flesh and some fever. 2. Chronic cough, complicated with, and rendered inveterate by, hypertrophy of the bronchial ramifications and dilatations of the air-cells. 3. The same complicated with, and rendered incurable by, morbus cordis, generally on the left side, sometimes on both sides of that organ. 4. True phthisis, which is always complicated with bronchitis, and pretty frequently with considerable hypertrophy of the heart. 5. Glandular marasmus in children, without in many cases any strictly pulmonic disease ;—when I recollect those facts, I cannot avoid feeling very sceptical as to the alleged paramount importance of true phthisis; and suspecting that in male adults at least, the most frequent of all fatal chronic disorders of these islands is disease of the heart. In this, perhaps, rash assertion, I have the satisfaction of finding that I go but one step in advance of one of the ablest practitioners, and largest and least fanciful observers that have especially studied the pathology of the heart. Baron Corvisart affirms, without hesitation, that the most frequent organic diseases, pulmonary consumption excepted, are those of the heart; and that death from cardaic lesion is much less rare than from lesion of either the brain, the stomach, the liver, the spleen, or the kidneys; or perhaps from all those organs together.

Contrast between morbus cordis and phthisis, in their relations to age, further illustrated.—Before passing on to the next topic, I may be permitted to dwell for an instant on a remarkable contrast between morbus cordis and phthisis, in their relations to age, which is shown in the first table deduced from the table of hearts, and which is in some degree curious in itself, but is at any rate pertinent enough to my present argument. If on the male side of the table we compare the distribution of morbus cordis with that of phthisis, we find a striking difference. The per centage proportion of morbus cordis, to the total number of cases, including phthisis

and morbus cordis at each interval of age, is as follows:—For the first, from 15 to 30, it is 21 per cent. For the second it is 36; for the third it is 40½; and for the fourth it is full 42 per cent. Whereas, for phthisis, the distribution changes in an inverse manner; being for the first age 45 per cent.; for the second, 28 only; for the third, 20; and for the fourth, 10 per cent. only, or one fourth only of what it was before 30. Then, on the female side, we have results agreeing sufficiently with those just stated on the male to render it probable that there is something more than chance in the matter. On the female side we obtain the following facts:—Morbus cordis gives for the ages 15 to 30, 15 per cent.; from 30 to 50, 17 per cent.; and from 50 to 70, the ratio rises to 29 per cent.; and above 70 years, to 33⅓ per cent.; while, on the female as well as on the male side, phthisis seems to decline with age, being, for the first interval of age, 24 per cent.; for the second, a little more than 17 per cent.; and for the third about the same, 16.4; and for the fourth only 5 per cent. Now the conclusion to which these facts lead, viz. the superior prevalence of morbus cordis as compared with true phthisis, at advanced ages, is confirmed by several passages in the classical work of Sir James Clark; especially by statements illustrating the influence of sex and age in the production of phthisis. In Chapter VIII., tables are given, exhibiting the mortality from phthisis above 15, in seven cities of Europe and America; which show that in almost each city there is a pretty uniform decline in the ratio of deaths from phthisis, from twenty years to extreme age; and the facts furnished by the excepted city —viz. Berlin—are at least a century old, being taken from Süssmilch. In Edinburgh the ratio declines from .285 at 20 years, to .052 above 60. At Nottingham, from .416 to .017, in the same period of time. At Chester, from .245 to .054; at Carlisle, from .290 to ·097; and at Paris, according to Louis, from .325 to .042; while the general average decline was from .285, or 28.5 per cent. at 20-30, to .078, or 7.80 per cent. above 60 years of age.

The following unpublished table, deduced some time since by my brother, Dr. G. Clendinning, now not in the profession, from observations registered at the Marylebone Infirmary, confirms the results to which Dr. J. Clark's enquiries have led him.

Of 1044 deaths from phthisis, occurring in the workhouse and infirmary jointly, of the parish of Marylebone, between May 1821 and December 1835, the distribution according to age was as follows:

Ages.	Deaths.	Ages.	Deaths.
Under 5 years . . .	70	From 40 to 50	164
From 5 to 10	17	" 50 to 60	121
" 10 to 20	53	" 60 to 70	97
" 20 to 30	247	" 70 to 80	45
" 30 to 40	222	" 80 to 90	7
	Total		1044

The following table gives the per centage distribution of phthisis, according to the preceding observation :—

	Per Cent.		Per Cent.
Under 10 years	$8\frac{1}{2}$	50 to 60 . .	$11\frac{1}{2}$
10 to 20 . . .	5 nearly.	60 to 70 . .	$10\frac{2}{3}$
20 to 30 . . .	$23\frac{1}{2}$	70 to 80 . .	$4\frac{1}{3}$
30 to 40 . . .	$21\frac{1}{2}$	80 to 90 . .	$\frac{2}{3}$
40 to 50 . . .	$15\frac{1}{4}$		
	Total		100

According, then, to the above, and Sir James Clark's table, the distribution of phthisis according to age is nearly such as I have stated, viz. phthisis declines in frequency soon after puberty, and has become comparatively rare in middle life, when it is for the most part superseded, as I conceive, in frequency and fatality by morbus cordis; and in extreme age, it disappears nearly altogether. It is to be regretted that, with respect to morbus cordis, I am precluded from producing a similar confirmation of my results, partly owing to the frequent exclusion of aged people from hospitals, and partly owing to the neglect of instrumental means of post mortem diagnosis, and the confidence misplaced by pathologists in their manual and visual skill.

CAUSES OF MORBUS CORDIS.

Influence of sex and age, and valvular defect.—The next topic for observation is the proximate and other causes of morbus cordis. It has been already cursorily stated that, of 170 to 180 observations of this disease in various stages and degrees, little less than five sixths were cases of simple hypertrophy, and the remaining one sixth only examples of hypertrophy with valvular disease.

Summary of facts.—In the cases of simple hypertrophy, nearly all had thickening or increase of muscular substance on the left side, principally in the ventricle; and in a large proportion of old subjects, the left ventricle alone was observed to be materially affected. In a considerable proportion of cases, which I have not recorded with sufficient accuracy for counting, there was enlargement on the right side, sometimes hypertrophous obviously, but often it appeared to me but an effect of distension by blood and mechanical dilatation in the final struggles. Of the cases, including unequivocal valvular disease, only three presented that morbid condition on both sides, or one in ten; while the remaining nine tenths had valvular defect on the left side exclusively. In both classes of cases of hypertrophy, viz. the simple, and the complicated with disease of the valves, there was the same preponderance of males over females, viz. about : : 2 : 1. In both classes of cases there was the same preponderance in the advanced intervals of age over the first interval of from fifteen to thirty. In both sexes the proportion of cases

of hypertrophy, whether complicated or not, increased with the age. On referring to the table of hearts, it appears that of about eighty cases of simple hypertrophy of males, but five occurred before 30; twenty-four happened between 30 and 50; thirty-four between 50 and 70; and thirteen beyond 70. And on the female side, in a total amounting to forty-three, in the interval 15 to 30, but five happened; in the second, eight cases occurred; and sixteen are noted in the third; and fourteen in the fourth period. And of the complicated cases, but one male and one female were under 30. From these facts it would appear very decidedly that sex and age have most important influences, as predisposing causes of morbus cordis, and that in general, hypertrophy of the heart is, if at all, then but occasionally an effect of valvular disease of that organ. With regard to sex, it seems that the male is more disposed to the disease by one half than the female; not only to the simple hypertrophous form, but also to the endocarditic or valvular.

Additional proof of increase of cardiac nutrition, &c. with age.—With respect to age, the tendency to augmented nutrition advocated in the previous lecture, when defining the normal heart, and proved by examination of a large number of healthy male and female hearts, is further strengthened by the facts of this section. The increasing intensity, so to speak, of the nisus nutritivus is proved by the constant advance above shown in the normal weight of the heart with advance of life; and the diseased heart shows likewise the intensity of nutrition to be proportioned to the age. For the male the average for morbus cordis was, for the four intervals of age above 15, as follows:—

14½ ounces was the average of five cases under 30.
17 ounces the average of twenty-four cases under 50.
15 ounces the average of thirty-four cases under 70.
15 ounces the average of thirteen cases above 70.

While for the female labouring under morbus cordis, the following were the numbers:—

12·2 ounces the average for five cases under 30.
12·37 ounces the average for eight cases under 50.
14½ ounces the average for sixteen cases under 70.
12½ ounces the average for fourteen cases above 70.

So that amid the general shrinking from diminished nutrition that attends advanced age, the male heart was heavier and more voluminous over 70 than under 30; and the female heart increased uniformly up to 70, when the degree of hypertrophy considerably exceeded that of any former interval, advancing from 12⅕ ounces to 14·5 ounces between 15 and 70, and not declining after 70 below 12½ ounces.

Influence of valvular disease.—With respect to the influence of valvular disease in particular in the production of hypertrophy, it appears probable, *à priori*, that the law of muscular nutrition that

determines increase of volume as a consequence of increased exertion, applies to the heart in common with other muscles. The increase of thickness in the left ventricle attending advanced age might be supposed to result from diminished elasticity in the aorta, which is known to acquire normally a certain degree of rigidity through time. The same explanation occurs readily to account for hypertrophy attending aortic aneurism, rigidity, or shrinking of the semilunar valves, &c. But such a view will not account for such effects as the increase of volume and weight so often observed in the hearts of phthisical subjects.

Hearts enlarged in phthisis.—In twenty-three males dead of phthisis, from 30 to 40 years of age, for example, I found the average for the heart to be 10 oz.; and in twenty other cases, between 50 and 70, I found it to be 10⅓ oz.; both averages exceeding considerably the corresponding averages for the healthy heart. Now as there was no mechanical impediment to the action of the left ventricle, which participated fully, and as much as in any other class of cases in the hypertrophy, such a fact requires an entirely different explanation from that referred to above.

No proof of prior disease of valves.—Then, again, it may be asked, what evidence is there that valvular disease is a frequent antecedent, and therefore may be a frequent cause of ventricular hypertrophy? And I know no facts that would justify a confident reply in the affirmative to that question, which I apprehend has been cut through hypothetically, not experimentally untied.

Author's view of the causation, with reasons.—The view of the matter that appears to me at present the most probable, is this:—Hypertrophy results from vital causes exclusively, and not from mechanical ones; and the more usual result of the action of those causes, where sudden and intense, is inflammation; but when moderate and gradual, they rather produce hypertrophy—a condition akin to inflammation, and one that augments enormously the susceptibility of the inflammatory process with which every part is normally endowed. Now to such supposed hypertrophy as the limit beyond which the operation of the vital causes referred to does not ordinarily pass, and to the morbid susceptibility of inflammation in every part too plentifully supplied with nutrient fluids, which such hypertrophy implies, I would refer almost all valvular disease occurring in mature years, especially in males, and such as could not be attributed to obvious causes, as falls, blows, or well-marked cardiac rheumatism, &c. I would thus in great part reverse the order of causation usually received, and attribute much of the valvular disease to inflammation, mainly induced, if rheumatism be excluded, by previous hypertrophy, as a most potent predisposing cause. The facts on which I found this opinion are shortly these:

1. Most cases, the great majority, in fact, of those of morbus cordis, have no disease of the valves. (I speak now of my own observations only, as the neglect by pathologists of instrumental means of diagnosis has put it out of my power to adopt, with full

confidence, their negative conclusions from their examination of subjects dead of heart disease.)

2. No case of valvular disease, with a trifling exception above alluded to, (Med. Gaz. p. 504, c. 1,) has occurred to me, uncombined with hypertrophy of the parietes, especially in the left ventricle.

3. Hypertrophy and inflammation are but different stages or degrees of the same process of over-nutrition by afflux and stasis of blood.

4. A large proportion, at least one sixth or one eighth, of the subjects of morbus cordis, are hurried off by pericarditis with or without endocarditis supervening upon an advanced stage of the disease, and attributable, I conceive, to the disease as to its principal predisposing cause at least.

PATHOLOGICAL RELATIONS OF THE ENLARGED HEART TO THE ABDOMINAL VISCERA.

Opinions of authors.—In the ætiology and pathology of the older writers, the influence of the abdominal viscera over those of the chest was considered very extensive and energetic. Asthma, dyspnœa, angina, syncope, hydrothorax, chronic cough, and other pectoral diseases, were attributed to affections of the stomach, liver, spleen, &c., and many pathologists still consider that, amongst the ventral organs, several are frequent causes of organic and other grave disorders in the chest, as well as in the other visceral cavities.

Such opinions conjectural.—Now if tangible evidence of the views just referred to be asked for, I am not able to point out where it is to be found. In reply to the question, has any advocate of the abdominal origin of pectoral diseases, published pathological facts sufficiently numerous, various, and pointed in proof, that such morbific influence of the abdominal viscera is real and important, I am obliged to answer that I know of no such collection of facts and proofs. Ingenious explanation, probable opinions, and striking cases, have, I am aware, been published; but the two former have been in my judgment too hypothetical, and the latter too few in number and equivocal in meaning; and on the whole, after considerable attention to the subject, I have had forced on me the conclusion that pathologists must have often mistaken effects for causes, and causes for effects; and, that wanting convenient and accurate tests of cardiac disease, and wanting still more some ready explanation of striking symptoms and morbid appearances, they found themselves necessitated to fix on the liver, spleen, or other abdominal viscera, in the absence of apparent probabilities in some other direction.

But there seems to me to be little in disease to warrant such opinions. Let me ask, how should hypertrophy of the stomach or encephalon produce general cardiac hypertrophy? Or how should hypertrophy of any organ, the lungs not excepted, be capable of

causing hypertrophy of the left side of the heart? I have given above facts of various kinds, and of an unequivocal character, as I conceive, in proof that hypertrophy of the heart is accompanied ordinarily by increase of weight and volume in the stomach and brain, as well as in every other viscus. Now assuming the correctness of these statements, how are such facts to be accounted for by abdominal morbific influence? In the physiology of health, the brain has apparently a more immediate and extensive influence over the heart, than any abdominal viscus; and of the abdominal viscera, unquestionably the apparent influence of the stomach exceeds in extent and energy that of the liver, spleen, pancreas, or kidneys; yet with a few exceptions, the brain and stomach have been excluded from the morbid causation by most advocates of the abdominal origin of pectoral diseases, and the whole of the supposed morbific power has been referred to organs inferior in apparent importance, energy, and influence. This might of itself beget suspicions—suspicions too which when once entertained, must quickly gather strength from further enquiry. Under such circumstances, one consideration will probably be found of great weight with the indifferent enquirer; viz., that the functions of the alleged morbific organs are in some cases wholly unknown, and in almost every case but very imperfectly ascertained.

Abdominal visceral functions too little known.—Of the splenic function, so far as I am aware, nothing is known: of the hepatic function I apprehend very little is known; and beyond the secretion of bile, a fluid of which the uses are yet somewhat problematical, nothing at all is known. Of the kidneys also, our knowledge is very imperfect. In consequence, then, of the obscurity that hangs over the uses of the abdominal viscera, the stomach perhaps excepted, there is in that quarter a large field open for conjectural ætiology, alike incapable of rigorous proof or disproof. The facility of assumption without risk of experimental or other satisfactory refutation that thus is seen to arise from our ignorance respecting the abdominal functions, ought to put the cautious *naturæ minister ac interpres* on his guard, and will, with other considerations, in all probability satisfy many, if not all indifferent enquirers, of the utter inadequacy of any facts that have yet been made public to substantiate a doctrine in itself so little probable as the abdominal origin of organic cardiac diseases.

The visceral enlargements of morbus cordis probably dependent on the cardiac disease, and not causes of it.—If, then, we exclude abdominal visceral influence from the ætiology of morbus cordis, how shall we explain the almost constant connection between cardiac disease and visceral enlargement in the abdomen as well elsewhere? To this question I see no satisfactory answer but this: that those visceral enlargements are, in some way or another, effects of the disease at the centre of circulation; and the grounds of this conclusion are summarily these:—

1. Morbus cordis is usually found to coincide with enlargement of all, or several of the viscera of the great cavities.

2. Some viscera which, from the nature of their functions and other reasons, appear less capable of affecting, in an unequivocal manner, the nutrition of the heart, such as the encephalon and stomach, pancreas and kidneys, are nevertheless found to participate equally with others that have more intmate anatomical and physiological relations with the heart, as the liver and lungs, in the general visceral hypertrophy attending morbus cordis.

3. Abdominal visceral hypertrophy is often met with without any disease in the heart. *Ex. gr.* of thirty and odd instances in the five hundred and odd cases from which my tables have been constructed, more than thirty cases had excess of weight in the liver of from ¼ lb. to 6 lbs. above the normal average, but without any decided abnormal development of the heart, viz., cases of phthisis amounting to nearly one third of the whole; cases of puerperal peritonitis amounting to four; as many cases of erysipelas, and of carcinoma uteri, and uterine hemorrhage, each one case; and ten or twelve other cases. One of the phthisical livers weighed 6½ lbs.; and another enormous liver that occurred in a male, dead of ascites with black or rather dark-green jaundice, weighed 154 oz., or 9 lbs. avoirdupois.

4. Chronic bronchitis, emphysema, and œdema pulmonum, &c., although apparently capable of obstructing the circulation more effectually than any abdominal hypertrophy and enlargement or induration of equal amount, are, when unattended by morbus cordis, usually quite free from abdominal visceral hypertrophy. *Ex. gr.* of eighteen cases of chronic bronchitis, nearly all the adult cases of that disease that I have met with, in which there was detected no enlargement of the heart, there was in no case any decided hypertrophy of any abdominal viscus, nor of the encephalon.

It is true that in phthisis, as I have stated in the paper in the Transactions of the R. M. C. S. D., I have usually found an enlargement of all the viscera; less considerable, indeed, than in well-marked morbus cordis, but yet sufficiently unequivocal. And this by itself would certainly appear to favour the opinion that morbid conditions of other viscera than the heart, might, if apparently capable of impeding the circulation, be reasonably supposed to produce more or less of the visceral enlargement and hypertrophy usually met with in morbus cordis. But in the same paper I have shown, or made it probable, in opposition to Louis and other authorities, that in phthisis the heart usually exceeds the normal dimensions in both sexes; and it is to this circumstance principally that I would at present refer the general visceral hypertrophy, commonly found in subjects dead of phthisis.

A

TREATISE ON NEURALGIA.

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TO

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THE AUTHOR.

39, *Queen Square, Bloomsbury,*
September, 1838.

If the importance of a disease were estimated according to its tendency to a fatal termination, Neuralgia would not be entitled to much notice; but it will demand the highest degree of attention, if the distressing character of its symptoms be taken into consideration.

The sufferings which frequently attend this dreadful malady cannot be exceeded, debarring the unfortunate patient from the pursuit either of business or of pleasure. When he seeks relief by mixing in society, he is constantly exposed to the action of causes which excite the return of his torture, and he is therefore doomed to a life of seclusion, generally when at an age of which hope and enterprise are the natural characteristics.

Neuralgia is a disease of frequent occurrence, appearing in a great variety of forms, and attacking every organ endowed with sensibility; it often stimulates other diseases, and may sometimes be mistaken for affections of a fatal character. The existence of inflammation, for instance, being suspected, active depletion may be employed, with no other effect than that of increasing the severity of the symptoms. On the other hand, to treat an inflammatory attack as neuralgia, would be attended by consequences still more serious. In some cases which have been abandoned as hopeless, upon the suspicion of organic and incurable disease, the symptoms have been subsequently found to depend upon neuralgia, and have either been cured by simple means, or have terminated spontaneously.

There is nothing more distressing to the feelings of a physician

than to be called upon to witness sufferings that he cannot relieve; and in no affection oftener than in neuralgia are the resources of medical skill exhausted in vain. Yet much may be gained by a careful and patient study of the habitudes of the disease; it is in the power of medicine to assuage, if it cannot always remove, the anguish of the patient; and, by well directed treatment, a complete and permanent cure may often be effected.

The question whether neuralgia ought, in strict propriety, to be regarded as a distinct form of disease, will be more advantageously entered upon, when its history, and particularly the nature of its exciting causes, have been examined. It may be objected, that many of these causes are themselves diseases, of which the neuralgia is merely symptomatic, and therefore that no separate description is required. But, on the other hand, it must be remarked, that in many cases no primary disease can be discovered; and even where this connection is evident, there is often a remarkable disproportion between the original affection and the neuralgia that proceeds from it, for the greatest suffering is frequently occasioned by the most trivial causes; that the neuralgia may be suspended or removed, although its primary cause continue, and is, from its nature, permanent;—that in many cases a cure is effected by means, the tendency of which would be to aggravate the symptoms of the original disease; and that the neuralgia often commences when the affection by which it was excited is declining, or has entirely disappeared. It is, moreover, one of the most formidable ills to which human nature is exposed, inducing the patient to submit to the most dreaded remedies; for with only a remote chance of obtaining relief, successive amputations have sometimes been performed. It is therefore hoped, that a work, whose object is to present a view of the principal points connected with an affection so formidable, will not prove altogether useless or unacceptable.

The term neuralgia, derived from νεῦρον nerve, and ἄλγος pain, was first employed by Chaussier,[1] who composed an excellent table, which contained all the different species of the complaint observed at the period of its publication. It is much to be regretted that this term is not universally adopted, as great confusion is still occasioned by the multiplicity of names employed by authors in speaking of the disease.

Another source of confusion arises from the different significations in which this term is employed. It was limited by Chaussier, and subsequently by other authors (in accordance with its etymology), to denote a morbid condition of the sentient nerves; but it has latterly been used in much more extended sense, to express the analagous affections of nerves possessing different functions, by which change of expression, diseases bearing no resemblance to each other in their external characters, are classed together such as certain forms of asthma, aphonia, vertigo, &c. It seems preferable

[1] Table Synoptique de la Névralgie.

to restrict the term to the sense in which it was originally employed, and in this treatise it will be confined exclusively to that signification.

Much has been written respecting the antiquity of neuralgic affections, and several passages in the old medical authors have been commented upon, where they are supposed to refer to these complaints; some of them, it must be acknowledged, are sufficiently vague and obscure; yet, when the nature of the disease and of its exciting causes is considered, no doubt can remain that it must have prevailed in every period, although it is probably more common in some conditions of society than in others; however, in consequence of the slight knowledge of pathology which existed in former times, disorders, different in their nature, but possessing any remarkable symptom in common, were classed together under the same name, and accordingly the neuralgiæ appear to have been confounded with other painful affections, such as gout, rheumatism, &c.[1]

It was not until the middle of the last century that neuralgia became the subject of minute observation, and obtained a separate description. This investigation was first excited by the publication of several excellent papers on tic-douloureux; subsequently, the disease was observed in nerves of other parts of the body, and the subject has been gradually advancing in interest and importance until the present day.

Nosology.—The neuralgiæ are not placed in a separate class in the nosologies of Sauvages and Cullen, but are arranged by these authors under several orders. Pinel[2] places neuralgia in the third order of his fourth class, neuroses,[3] and gives it the following definition:—

"Douleur vive et déchirante, avec des élancemens, et des tiraillemens successifs, sans chaleur, sans rougeur, sans tension et gonflement apparens. La siége de la douleur est fixé sur un tronc ou sur une branche du nerf, et elle semble s'elancer du point primitivement affecté sur toutes ses ramifications."

Dr. Good places the disease as the sixth genus of his fourth class, neurotica. He describes it as follows:—

"Acute sensibility and lancinating pain in the course of one or more branches of nerves in an organ; mostly with irregular motion of the adjoining muscles; recurrent in short paroxysms, with indeterminate intervals or remissions."[4]

This disease cannot be described, however, in such brief sentences; it varies exceedingly in its symptoms;—the following description is intended to represent its most common form.

[1] See Neuralgia facialis.

[2] Nosographie Philosoph. vol. iii.

[3] Lesions du sentiment et du mouvement sans inflammation ni lesion de structure.

[4] Study of Medicine, vol. iii.

Symptoms.—The pain is of a peculiar character, being usually described by patients as thrilling, shooting, darting, plunging, &c. It attacks in paroxysms, consisting either of a single stroke of excruciating agony, or, more commonly, of a succession of shocks, which rapidly follow each other for a few seconds, and then vanish, leaving in many cases an obscure aching pain, and rigidity of the neighbouring muscles. It is sometimes seated in a particular nerve, whose course it follows accurately, and darts like an electric shock along its ramifications.

In the majority of cases, the pain shoots towards the terminal extremity of the affected nerve, and is felt most acutely in its cutaneous branches; but it sometimes takes the contrary direction, ascending from the extremities of the nerve towards its trunk.

It sometimes darts from a central point both upwards and downwards;—at others, it flies rapidly along the nerve, and again returns through the same course, to the point where it commenced;—at others, and much more frequently than is usually represented, it radiates in all directions, without observing the course of any nervous branch.

There is also considerable variety in the apparent velocity of the pain as it shoots along the affected parts. In general, as has already been remarked, the shock is instantaneous, but the painful sensation occasionally creeps slowly along the nerve, and, indeed, may be observed of every degree of rapidity.

The pain sometimes flies from one situation to another, attacking either a remote part, or the same set of nerves on the opposite side of the body; or it may pass from an external to an internal organ. These transitions are often performed with wonderful rapidity;—the disease is rarely observed in more than one situation at the same time.

The space occupied by the pain is also various. It is sometimes diffused over a large surface, but at others is confined to a point, which might be covered with the finger, and in general appears to be more severe in proportion as it is circumscribed.

The parts through which the pains shoot are sometimes exquisitely tender, but are frequently affected with numbness. In those cases where the pain is spread over a large surface, it is generally described as aching, but in addition to this, the more common lancinating pain darts through the affected part during the paroxysms.

When the seat of the neuralgia is near a secreting organ, the latter is often stimulated to increased action; a superabundant quantity of its natural fluid is separated, and with this symptom the paroxysm usually terminates.

In general, the seat of neuralgia presents no outward indication of disease; but its colour, temperature, and form, remain unchanged; the skin, however, is sometimes covered with a slight blush, whilst in other cases it is paler than natural; occasionally also a moderate degree of swelling and increased heat accompany the pain; and the

nerve itself, when seated superficially, has sometimes been observed to become prominent during the paroxysms.

The pulse is seldom sensibly affected, but in some cases it becomes slower at the commencement of an attack, and rises when the pain is at its height. Lentin has recorded a case where he observed the pulse to become slower by fifteen beats in a minute during the whole time of the paroxysms.[1] In a case of neuralgia of the ophthalmic nerve, Van Swieten thought he felt the pulsations of an arterial branch at the inner canthus of the eye, to be quicker, and relatively stronger, than in other parts of the body.[2]

In many cases no warning symptoms announce the approach of a paroxysm, the patient being struck suddenly with the most acute sufferings; in others, the attack is preceded by heat, cold, itching, throbbing, or some analogous sensation; and occasionally by a feeling similar to the aura epileptica. When the patient becomes aware by any of these feelings that an accession is at hand, the utmost horror is often manifested in his countenance; he implores assistance from those around him; or, endeavours to summon up all his fortitude to resist the attack, pressing the seat of the disorder with all his might, and sometimes throws himself upon the ground, totally overcome by the agony which he undergoes.

The attacks are sometimes periodical, returning at particular hours, with remarkable regularity. Several may take place on the same day, or they may assume the quotidian, tertian, or quartan type. Cases are also recorded where the intermissions extended to several weeks, or even to a longer period. Often, however, the attacks are altogether irregular, occurring whenever the patient is exposed to an exciting cause; and, indeed, frequently where none can be observed. In some cases the intermissions are incomplete, and the disease takes the remittent type, with well marked and more or less frequent exacerbations. These cases may be mistaken, particularly when the viscera are the seat of the disorder, either for acute inflammation, or for some organic disease; and it is sometimes difficult to give a decided opinion upon their real nature. This difficulty is moreover greatly increased, when, as sometimes happens, the lancinating character of the pain is not remarkable, and where the sufferings are increased by pressure over the part affected;—a careful enquiry, however, into the history of the case, will generally be sufficient to determine the practitioner in his diagnosis.

Complications.—It sometimes happens that neuralgia alternates with some other nervous affection, such as ague, epilepsy, &c. Sir B. Brodie mentions a case where it alternated with insanity.[3]

In the case of Sarah Willis the most violent enteralgia was succeeded by an attack of aphonia, and the latter was immediately removed after a free evacuation of the bowels.[4]

[1] Blumenbach's Medicinische Bibliotheck.
[2] Van Swieten Commentor. in Aphorism. Boerhaav, vol. ii. sect. 757.
[3] On Local Nervous Affections.
[4] Case i. at the end of the volume.

In another instance, that of Lucy Payne, nervous pains of the face and other parts alternated with a spectral appearance, which assumed the shape of a brilliant eye constantly beaming upon her.[1]

In Sherwyn, neuralgic pains alternated with chorea, involuntary screeching, and other nervous symptoms. Afterwards, she was, haunted for several hours each day by the figure of a black cat, which appeared to be staring at her from the opposite side of the room.[2]

The complaint does not always amount to absolute pain, but consists of some unusual sensation, such as itching, burning, cold, &c. returning in the same periodical manner, and presenting other general characters of neuralgia.[3]

Predisposing causes.—Persons in the prime of life appear most liable to neuralgic affections, from which infancy and old age are generally supposed to be equally exempt. As far as regards protracted age this opinion is certainly well founded; it is not uncommon for patients who have been tortured by the disease for a long series of years, to enjoy an entire cessation from it in the decline of life, a calm rendered more grateful from the remembrance of former sufferings. At a late period of life, the nervous system becomes less susceptible to impressions, and the blunted sensations seem incapable of responding to the excitement which at an earlier age was sufficient to produce the disease. Yet neuralgia, even in its severest forms, is not unknown among old people. Thouret has recorded the case of a lady aged eighty-five, who had been subject to facial neuralgia upwards of thirty years. Another lady, mentioned by the same author, was attacked with this disease at the age of seventy-eight.[4] Dr. Haighton has detailed a case of facial neuralgia, occurring in a lady seventy years of age.[5] Similar instances are given by other authors.

It may be doubted, also, whether infancy is so free from the complaint as is generally imagined; the transient but severe pains so frequent in early life, and which are commonly described as griping, bear a close resemblance to visceral neuralgia. Other forms of the complaint are also occasionally met with in children, as in the following case.

In July, 1833, a little girl aged two years, with every appearance of good health, was brought to me, presenting the following symptoms:—She was seized about four times a day with severe pains of the left side of the face; these paroxysms continued a few seconds only, during which the head was drawn towards the affected side; she seemed to be aware when an attack was approaching, for she then left her playthings and ran to her mother, crying, as if afraid; —tenderness was evinced on pressure over the upper cervical vertebræ; leeches were applied to the spot, and a quinine mixture prescribed, under which treatment she recovered.

[1] Case II. [2] Case III. [3] Cases IV. V.
[4] Histoire de la Societé Royale de Médicine, vol. II.
[5] Medical Recollections and Researches.

M. Coussays observed neuralgia of the sciatic nerve in a little boy seven years of age.

The predisposition to neuralgia is so strong in some habits, that the most trivial accident is sufficient to give rise to the complaint. It attacks most frequently persons of the nervous temperament, and all agents which tend to develope that temperament, more or less contribute to induce it. Thus, it attacks females more frequently than males, and prevails more among the inhabitants of crowded cities, than of country districts. Like other nervous affections, it is observed more commonly among refined and highly civilised communities.

The disease is also supposed to be more prevalent among the rich and luxurious. Frank[1] says that during a practice of several years, he did not meet with a single case at the hospital of Leipsic; whilst, during the same period, he treated several cases among the wealthy inhabitants of that city. This may lead us to attribute the disease sometimes to plethora, particularly as it is observed to be aggravated by other agents having a tendency to promote that condition, such as suppression of accustomed discharges, inactivity, &c.

But neuralgia is no stranger in the abodes of misery and destitution, at least in this metropolis; it is indeed often induced by causes which have a tendency to debilitate the system, such as mental anxiety, want of sleep, impure air, imperfect nourishment, abuse of spirituous liquors, and the like.

There appears also to be an hereditary predisposition to this complaint, for it has been observed to attack patients whose parents had previously been affected with it, or in whose families insanity, epilepsy, or some other disease of the nervous system had prevailed.

Besides this general predisposition to neuralgic affections, there is another question connected with this subject, namely, whether there is any peculiar tendency in particular parts to become affected with it, especially in cases where the pains appear in situations remote from that where the irritation is applied, or wander, apparently without observing any rule, from one organ to another.

In the case of John Cummin,[2] the pain invariably flew to that organ which was in a fatigued state, attacking the legs after a long walk, the arms when he had been working hard, &c.; and in Dillon,[3] the mammæ became affected immediately prior to the menstrual periods.

This disposition of the disease to wander may often be observed where any irritation has been excited by means of blisters, issues, or by any accidental circumstance, in parts remote from the seat of pain. When this occurs, the complaint very commonly vanishes from its original situation, and attacks that which has in this manner been prepared, as it were, to receive it.

[1] Praxeos Medicæ Universæ Præcepta.
[2] See Case VI.
[3] See Case VII.

A curious example of this kind has been given by Hoffmann, in a patient who was subject to severe pains about the neck and scapula, for which a vein was opened in the left foot; immediately after the operation, the pain of the neck and shoulder began to remit, but the patient experienced the most excruciating suffering in the leg. Commencing at the toe, it extended over the foot as far as the knee, although no lesion was discernable externally.[1]

Instances of this occurrence are also mentioned by Siebold, Gunther, and others, where the neuralgia left its former seat, upon the establishment of some fresh irritation in a distant part.

These facts seem to warrant the opinion, that a local predisposition exists in the parts affected with neuralgia, and that the tendency of the disease to change its seat, is totally unconnected with any peculiarity in the nature of the exciting cause.

The character of the pain itself, as to whether it be diffused, lancinating, &c., is also probably determined by some peculiar predisposition in the part where it is situated. I have observed, in many cases, where the pain is diffused, that there is remarkable tenderness of the integument.

Exciting causes.—It is a most important consideration in the study of neuralgic affections, to examine into the nature of the exciting causes: these are so numerous, and so various, that a single glance will be sufficient to show the fallacy of those theories which trace all cases to one common origin, an error, however, into which some able practitioners have fallen.

Exposure to wet and cold, particularly to a stream of cold air, is a frequent cause of neuralgia; thus it is often occasioned by sitting at an open window or door, by insufficiency of clothing in inclement seasons, &c.

Thouret gives a case of a gentleman, who was first attacked with facial neuralgia (with which he was afflicted for several years) after exposure to a snow storm, where the wind beat violently against his face.

In Clerk[2] the complaint originated from the same cause; and, indeed, patients very commonly attribute the commencement of their sufferings to cold. I recollect some cases, which appear to have arisen from the long continued application of cold to a part, as from sitting at an open shop window for many hours of each day, or in a counting-house, exposed to draughts of cold air. In these cases, the complaint was not induced immediately or suddenly, for the patients had pursued the same avocation for several years, without experiencing it, and sometimes had retired altogether from the employment before their sufferings commenced.

Cutaneous irritation.—Neuralgia may be occasioned by irritation applied to the surface of the body, as from cutaneous eruptions, contusions, cicatrices, &c. The pains which accompany the herpes

[1] F. Hoffmann, Consult. et Respons. Med.
[2] Case VIII.

zoster are an example of this; and it is remarkable that they are often exceedingly severe before any sign of the eruption can be distinguished. This fact is of importance, inasmuch as it seems to establish the principle, that simple congestion, or an unnatural determination of blood to an organ, is sufficient to cause some neuralgic diseases; the pain continues, however, during the eruptive stage, when the paroxysms are excited by every circumstance which increases the heat of the surface, nor do they in every case subside immediately after the cutaneous affection has disappeared.

In a similar manner, the irritation from a leech bite sometimes causes neuralgia, as in the following case:—

A gentleman, aged twenty-five, had an exceedingly irritable bubo in the left groin, to which leeches were applied; two days afterwards, he was awakened about four o'clock in the morning with acute lancinating pain, proceeding from one of the leech bites, and extending over the surrounding skin; the pain was entirely superficial, and was of a different character from that of the bubo; after continuing about three hours, the paroxysm terminated suddenly; it did not return on the following day, but on the second morning, precisely at the same hour, the attack was renewed, and continued about the same time as before. The bubo subsequently became more indolent and less painful, and the neuralgic affection disappeared.

Several authors have related cases of neuralgia which arose from contusions; and some well authenticated facts are recorded, where the disease proceeding from this cause continued for months, and even years after the accident, and where the symptoms have been subsequently proved to originate in this manner, by their immediate subsidence upon making a crucial incision over the contused part.

Pouteau relates the case of a young man who received a kick on the tibia, which shortly afterwards was succeeded by severe pains, extending from the thigh to the leg and foot; this pain continued for many years, and was finally removed by making a crucial incision over the affected part.[1]

Larrey had a patient who was attacked with severe facial neuralgia, subsequently to receiving a blow with a foil, over the course of the infra-orbitar nerve.[2]

In Elizabeth Hawker,[3] the complaint seems to have had a similar origin: she was attacked with severe pains of the sides of the neck and temples, which she attributed to a severe blow received upon the scalp, in falling against a grate six months previously.

The disease has, in some instances, been traced to the irritation arising from an old cicatrix. "We find cases (Dr. Bright observes) which lead us to believe that tic-douloureux sometimes originates in affections of the extremities of the nerves, and may be derived

[1] Œuvres posthumes. [2] On the Use of the Moxa. [3] Case IX.

from wounds of fleshy parts, and cured by applications to the cicatrix."[1]

Lentin met with a case of facial neuralgia, which apparently proceeded from a cicatrix remaining after a wound in the face.[2]

Elizabeth Burley, aged sixteen, had suffered for several weeks from acute lancinating pain of the left temple and side of head, for which many remedies had been tried without effect. Upon enquiry into the history of the case, it was discovered that some years ago she had received a severe cut over the right parietal bone, which had been long healing, and that this spot had always been tender since the accident. When the hair was removed, a large uneven cicatrix was observed; a blister applied over this spot relieved the pain for several weeks, when it again recurred. After trying various remedies, it was proposed to make a crucial incision through the cicatrix, but the patient refused to submit to the operation, and soon afterwards discontinued her attendance.

The neuralgia does not always, in cases of this description, occupy the actual seat of the injury, but is often at some distance from it.

Overstretching of nerves.—Neuralgia is sometimes produced when a limb is kept forcibly extended for a considerable period. Wormald's case[3] is a curious example of the disease originating from the suspension of a heavy weight to the left arm during several minutes; and it is worthy of remark, that the pains were felt with equal severity in the lower extremities as in the upper.

A lady riding on horseback, was nearly thrown from her seat by a sudden start of the animal;—a gentleman, by whom she was accompanied, seized her arm, and suspended her by it for several seconds; immediately afterwards, she began to suffer acute lancinating pain in the fore-arm.[4]

The neuralgia which follows excessive fatigue is probably induced upon a similar principle.

A French conscript, after making great efforts to escape from the gens d'armes, by whom he was pursued, was attacked with excruciating pain in the course of the sciatic nerve, which was subsequently discovered in a state of inflammation.[5]

A medical student, who had made great exertions in swimming, experienced stiffness in the arms and shoulders, which continued several days. When this symptom had nearly subsided, he was attacked with paroxysms of acute lancinating pain, which darted from the spine of the left scapula towards its inferior angle. It was not increased on pressure, and was unattended by heat or swelling. About three paroxysms occurred daily, and continued about two or three hours.

[1] Bright's Medical Reports.
[2] Blumenbach, Med. Chir. Bibl.
[3] See Case x.
[4] Piorry, Clinique Médicale.
[5] Martinet, Revue Médicale, 1824.

Pressure of nerves.—Neuralgia is often the consequence of the pressure of a nerve by a foreign body, an enlarged organ, the dilatation of a vessel, tumour, &c.

There is, for instance, a particular species of tumour (commonly described as the subcutaneous tubercle) which is characterised by being exquisitely tender to the touch, and occasioning pain in every respect similar to neuralgia; these little tumours sometimes escape detection, or, at least, may not be discovered until the patient has undergone many years of torment, and has been wearied by the trial of unavailing remedies; they are situated immediately beneath the skin, and are met with in all parts of the body, but most commonly in the extremities;—they have sometimes been found connected with, or separating and stretching, minute nervous fibrillæ. Mr. Swan removed a tumour of this description, in which "a cutaneous nerve was seen passing between it and the skin, and an expansion of the nerve was spread over it."[1] In general, however, these tumours appear to have no direct communication with nerves, or, at least, none that can be traced by means of the scalpel. They differ in size, from a millet-seed to a small pea; their sensibility varies at different periods, for they may sometimes be examined and pressed without occasioning much suffering, whilst at others, the slightest touch induces a paroxysm, in which the pain either radiates in all directions around the tumour, or darts along the track of one or more nervous filaments.

Dupuytren, in his lectures, observed that all the tumours of this description that he had witnessed had a remarkable resemblance to each other, being composed of an envelope of cellular tissue, loosely attached and easily removed, and, beneath this, a substance of a fibro-cartilaginous nature, having the colour and texture of a dried pea, without any hollow in its centre, and so extremely elastic, as to rebound actively when dropped upon the ground.

Sir Astley Cooper also describes them as "composed of a solid and semi-transparent substance with fibres interwoven in it, but without any regular distribution."[2]

In some instances, they seem to be formed with great rapidity. A woman under my care for another affection, perceived one of them on the side of the leg, which she was confident had appeared within a few days.

They seldom subside spontaneously; one example only of this occurrence is mentioned by Descot, which was in the person of the celebrated Beclard. When he was a student at Paris, a hard tumour, about the size of a grain of wheat, formed in his leg. It occasioned excessive suffering, but disappeared in a few months, upon his removing from an unhealthy apartment, which he had occupied for a considerable period.[3]

The extirpation of these superficial tumours, is generally followed

[1] Swan on Diseases and Injuries of Nerves.
[2] Sir Astley Cooper on Diseases of the Breast.
[3] Descot sur les Affections Locales des Nerfs.

by the complete cessation of the pain; and sufferings which had rendered existence almost insupportable, are instantly terminated by an operation devoid alike of difficulty or danger.

Cheselden removed one of them from the nates, not larger than the head of a pin, which was so exceedingly painful, that the least touch excited dreadful torture. The patient, who could not put his foot to the ground, or even turn in his bed, without the most acute suffering, was immediately relieved by the operation.[1]

Innumerable cases, almost precisely similar to the above, have been recorded by various authors; but it would be tedious to dwell further upon this topic.[2]

Other tumours are also found adhering to nerves or embedded between their fibres, exciting acute pain, which darts along the course of their filaments. They are composed either of a solid substance, or of a cyst, containing gelatinous matter, and "vary in size from a grain of wheat to a substance of considerable magnitude."[3]

Carious Teeth.—Among the causes of neuralgia, the influence of a carious tooth in producing the disease cannot escape notice. It is generally supposed to act by irritating the branches of the fifth pair; but it is important to recollect, that nerves in all parts of the body may become affected from the same cause.

A man, aged seventy, suffered severe pain in the left shoulder, which extended along the inside of the arm; it subsequently quitted that situation, and flew to the heart, retaining its lancinating character. After alternating between these two situations for several months, it finally attacked the first molar tooth, in which, upon a close examination, a deep caries was discovered, which had been previously overlooked; the tooth was immediately extracted, and the symptoms subsided.[4]

Mr. Bell met with a similar case, in a gentleman who had for some time suffered from a neuralgic affection of the right arm; the paroxysms were subsequently observed to commence with pain in the second molar tooth, and to be excited whenever it was pressed or otherwise irritated. Upon the removal of the tooth the pain disappeared.[5]

Neuralgia from disorders of the alimentary canal.—The difference of opinion which prevails, even among eminent pathologists, respecting the frequency of the disease, arising from this cause, is truly remarkable; it is maintained by many, that the greater number of cases depend upon gastric or intestinal irritation; whereas Montfalcon,[6] Dr Elliotson,[7] and some others believe that there are no just grounds for this opinion.

[1] Cheselden's Anatomy.
[2] See Dr. Marshall Hall on Diagnosis;—Wood, Edin. Med. and Surg. Journal, vol. viii.—Descot Sur les Affections Locales des Nerfs.
[3] Mayo's Pathology.
[4] Piorry Clinique Médicale.
[5] Bell on the Anatomy, Physiology, and Diseases of the Teeth.
[6] Montfalcon, Dictionnaire des Sciences Médicales, art. Neuralgia.
[7] Elliotson, Cyclopedia of Practical Medicine, art. Neuralgia.

These totally opposite sentiments, among persons so well qualified to judge upon the subject, sufficiently attest the difficulties that attend its investigation; there are, in fact, several sources of error, which it is necessary for the practitioner to examine before he decides that gastric disorder is the origin of a neuralgic affection.

In the first place, when dyspeptic symptoms and neuralgia occur together, it is not always an easy task to determine which of these disorders ought properly to be regarded as the original one; for in neuralgia, especially in protracted cases, from whatever cause they may arise, the stomach generally participates sooner or later, in the disturbance occasioned by the excessive, and almost constant suffering.

In such cases, it would be easy to mistake for the cause of the disease, a condition which is one of its natural consequences. Even when the paroxysms of neuralgia are excited or calmed, accordingly as the digestive functions are healthily performed or otherwise, the evidence of a gastric origin is still incomplete.

When neuralgic symptoms disappear, after the long continued employment of purgative medicines, this circumstance alone, will not be sufficient to prove that the complaint was produced by the accumulation of irritating matter in the intestinal canal, for this remedy may also act as a derivant from the brain or spinal marrow.[1]

But allowing these considerations their due importance, and weighing cautiously the evidence, it is impossible, I think, to refuse assent to the opinion, that irritation of the primæ viæ is capable of exciting the disease; in many cases this evidence is as direct and positive as it is possible to arrive at in reasoning upon medical subjects.

Innumerable cases are recorded where neuralgic attacks have been suddenly excited by the presence of indigestible food in the stomach, and have as suddenly disappeared upon its rejection, in patients not subject to the disease, and where no other cause for the malady could be discovered.

The passage of cathartic medicine produces neuralgic pains in some habits. Mr. Swan was acquainted with a gentleman, in whom pains of the fingers were excited whenever he had a motion.[2] The irritation of the intestines in consequence of worms also gives rise to neuralgic pains, which cease immediately upon their expulsion.

Sir B. Brodie mentions the following circumstance of the late Dr. Wollaston. He ate some ice cream after dinner, which his stomach seemed to be incapable of digesting; some time afterwards, when he left the dinner table to go to the drawing room, he found himself lame from a violent pain in one ankle. Suddenly he became sick; the ice cream was rejected from the stomach; and this was followed by an instantaneous relief of the pain in the foot."

The following remarkable case is from the same author.

[1] Alison. Hist. of Medicine in Cyclo. of Pract. Medicine.

[2] Swan, l. c.

"A gentleman awoke in the middle of the night, labouring under a severe pain in one foot; at the same time that some other sensations, to which he was not unaccustomed, indicated the existence of an unusual quantity of acid in the stomach. To relieve the latter, he swallowed a large dose of an alkaline medicine. Immediately on the acid in the stomach having been thus neutralised, the pain in the foot left him."[1]

The more serious disorders of the intestinal canal may also prove the source of the disease. Andral had a patient, in whom it occurred in connection with chronic gastritis, the pains being aggravated or mitigated according to the changes of the gastric affection.[2]

But in many cases there is no reason whatever for attributing the complaint to derangement of the stomach and bowels, for the functions of these organs are often performed with the greatest regularity, and the patients, notwithstanding the severity of their sufferings, retain every external appearance of sound health; moreover, in most protracted cases, the purgative plan of treatment has been repeatedly resorted to, without effecting a cure.

The disease may also be occasioned by disorder of the other abdominal viscera, a familiar example of which occurs in the pains of the shoulder and arm, which accompany disease of the liver.

Neuralgia from diseases of the urinary organs.—The nervous pains arising from this cause are often of a very severe description.

Sir B. Brodie relieved in an instant a distressing neuralgic affection of the foot, by penetrating a stricture of the urethra, and passing a catheter into the bladder.[3]

Mr. Swan mentions a case where pain of the backs of the fingers was induced by evacuating the bladder when much distended.[4]

A patient, whom I saw with Mr. Brown, of St. Mary Axe, complained of severe pain of the right side of the abdomen in the pubic region, simulating peritoneal inflammation; there was also much tenderness over the left kidney, but none whatever over the right. In a post mortem examination, no sign of inflammation could be detected in the bladder or the abdomen; the left kidney, over which the tenderness had been observed, was also perfectly healthy, but into the lower part of the medullary portion of the right kidney, a considerable quantity of pale, cream-like pus was infiltrated.[5]

Neuralgia from disorder of the heart and large vessels.—The manner in which this cause acts in producing neuralgia, varies in different cases. In general it appears, to be the consequence of the disturbance in the distribution of the blood, occasioned by affections of the heart, by which one organ receives more than its natural quantity, whilst another is in a state of anæmia.

In this way neuralgic affections occur, in consequence of increased

[1] Sir B. Brodie, l. c.
[2] Andral Clinique Médicale, vol. ii.
[3] Sir B. Brodie, l. c.
[4] Swan, l. c.
[5] See Abernethy's Lectures, Lancet, vol. vi. 1825.

impetus of the blood to the brain and its membranes, when the action of the ventricle is too great, or of some impediment to the return of the blood to the right side of the heart; or other vessels may become distended from the same cause, and pressing upon their accompanying nerves excite the disease.

Neuralgia of the thoracic parietes, the side of the neck or head, shoulders and arms, especially the left arm, very often arises from the bulk and irregular action of a diseased heart. Frequently, also, the gastric nerves become affected from the same cause; and sometimes the irritation is communicated to the spinal column.

When the disease arises from this cause, it is generally of an irregular type, for the paroxysms are excited by unusual exertion, by mental disturbance, or by any other circumstances which induce inordinate vascular action, and are calmed by rest, and by the remedies which have a tendency to diminish the force of the circulation.

Frequently, severe cases of the disease are connected with aneurisms of the thoracic and abdominal aorta, when the pains are often very circumscribed, and are chiefly felt in the back or extremities.

Mr. Greville Jones removed a large aneurism of the aorta from the body of a man in Islington workhouse, who had been remarkable for the violent lancinating pains he suffered in the chest, and who suddenly fell dead. On minutely examining the state of the nerves, they were found much enlarged, and adherent to the diseased mass. In the drawing which Mr. Jones has been so kind as to show me, the recurrent nerve where it passes behind the aorta, appears of from four to five times the natural size, and it was, of course, stretched by the tumour.

Neuralgia from uterine disorders.—It is to this cause, rather than to any peculiarity of temperament, that the greater frequency of the disease in females is to be ascribed. It is very commonly met with at the first approach of the catamenia, and sometimes, at this period, injuries which had occurred in childhood, and were almost forgotten, become the seat of violent neuralgic pains. Some women suffer from modifications of the disease, at every return of the menstrual period.

A short time ago, a woman came under my care who had suffered from severe facial neuralgia for several years, which appeared and disappeared regularly with the catamenia.

That peculiar form of neuralgia which stimulates visceral inflammation, very commonly originates in uterine disorder.

The uterus may also become the source of neuralgia, by its pressure on the surrounding nerves, when it is enlarged by tumours, or in gestation, or when its displacement has occurred.

Neuralgia from spinal irritation.—The great influence which diseases of the spinal column exercise over the functions of other organs, has been long known to medical practitioners.[1] This

[1] See Dr. Craigie, in his Review of Bradley, on a Stridulous Affection of the Bowels.—Edin. Med. and Surg. Journal, vol. xlv. 1836.

principle of pathology has recently been applied with great success, in tracing the origin of neuralgic affections, by which many highly important observations have been accumulated, where the symptoms of the disease have been found in connection with tenderness over that portion of the spine which corresponds to the origin of the affected nerves, and have been speedily and permanently removed by the application of remedies over that part.

From the works of Pouteau, published in 1785, it is evident that the spinal origin of neuralgia was well understood by that eminent surgeon, but in common with the pathologists of his time, he confounded this disease with others of a more formidable nature; the history of some of the cases described by him under the title of Gibbosité, bear a perfect resemblance to the neuralgia from spinal irritation of modern authors: thus, severe pain in various parts of the body, was attributed by him to an affection of the spine, denoted by tenderness, on pressure, over a small portion of that organ. The remedies were directed to the central source of irritation, and consisted chiefly of the application of moxas to that spot. By this means he cured many cases which had previously resisted every other mode of treatment.[1] This source of painful nervous affections is also distinctly alluded to in the work of Dr. Bradley,[2] and in a communication by Mr. Player.[3]

The publication, however, which appears to merit the reputation of having directed general attention to this subject, is an excellent paper of Dr. Brown's, of Glasgow, published in the Medical Journal of that city, in 1828. In the following year, a paper appeared from the pen of Dr. Darwall, of Birmingham,[4] and, subsequently, a work by Mr. Teale of Leeds,[5] the latter of whom, in particular, detailed many cases, in which various forms of neuralgia were found connected with spinal irritation. Since that time, several other practitioners have published the result of their experience on the same subject.[6]

It is remarkable, that in this kind of neuralgia, the patient seldom complains of pain in the back, except when the spine is examined, either by pressing each vertebra successively, or, as some prefer, by applying a sponge, dipped in hot water, along the course of the spinal column. When this process is adopted, tenderness is immediately manifested, by the patient shrinking from the examination as soon as a particular spot is touched, and dreading its repetition; in general, the tenderness is confined to one vertebra only, but it sometimes extends to two or more, and occasionally two distant vertebræ are simultaneously affected, whilst the intervening space

[1] Pouteau's Œuvres Posthumes.
[2] Dr. Bradley, l. c. See c. xiii. on Spinal Disease, unaccompanied with change of structure.
[3] Quart. Journal of Science, 1821.
[4] Midland Medical Reporter.
[5] A Treatise on Neuralgic Diseases.
[6] See Griffin. Observations on Functional Diseases of the Spinal Cord.

remains free from pain. Sometimes, also, pressure over one portion of the vertebral column excites pain in another and distant portion of it. The tenderness frequently disappears suddenly from a part of the spine where it had been first observed, and fixes itself in another which had previously been free from it. The irritation is not generally perceived over the spinous processes of the vertebræ, which may be pressed with some force, without any pain being excited, whilst exquisite suffering is produced when the pressure is applied over the sides of the vertebræ.

The evidence in proof of the dependence of nervous pains upon that condition of the organ and the nerves which is indicated by spinal tenderness, is sufficiently direct and satisfactory. There is a constant relation between the seat of the pain and the vertebra where the tenderness is observed. Thus, when the irritation is over the cervical region of the spine, the neuralgia will be felt in the scalp, neck, and temples; tenderness over the dorsal vertebræ is accompanied by pains of the upper extremities and thorax; when it is perceived over the lumbar vertebræ, the neuralgic affection attacks the pelvis and lower extremities. Similar observations have been made in cases of internal neuralgia, where the tenderness is found over that portion of the spine where the nerves which communicate with those of the affected viscera take their origin. Further proof of this connection is derived from the paroxysms being produced whenever the tender portion of the spine is firmly pressed, and by the subsidence of the symptoms upon the application of remedies to that situation.

Respecting the nature of spinal irritation, little more than conjecture has hitherto been advanced.

Pouteau supposed that it arose from an irritating fluid applied to the spinal nerves.

Dr. Brown suggests, that it might depend "upon the spasm of one or other of the muscles arranged along the spine, altering the position of the vertebræ, or otherwise compressing the nerves, in their issue from the spinal marrow."

Dr. Darwall is inclined to believe, "that in most cases, there is some irregularity in the local circulation; that there is frequently congestion, and it may be conceived, that it will sometimes proceed into acute or chronic inflammation."

Mr. Teale is of opinion, "that it consists in the lighter shades of inflammation, seldom attaining those violent degrees of intensity which are attended with obvious disorganization."

There can be no doubt that each of the above morbid conditions, considered by their respective authors as the proximate cause of this kind of neuralgia, would be attended by pain in those organs deriving their nerves from the affected portion of the spine; but the history of spinal irritation contains facts which cannot be explained upon either of those hypotheses;—indeed, there are good reasons for believing, and in some instances there is satisfactory proof, that spinal irritation is not generally dependent upon any primitive affec-

tion of the spine whatever; for it is not attended with febrile excitement, and is often observed to remove suddenly from one portion of the spine, and appear in another. The irritation may be continued for an indefinite period, without occasioning symptoms of an alarming nature; and when an opportunity is afforded of making a post mortem examination, dissection reveals no alteration of structure in the affected parts; moreover, several of the facts connected with this subject, favour the opinion that spinal irritation is not, generally, an idiopathic disorder, but that it is merely the consequence, and the index as it were, of morbid action in other organs.

In Dillon,[1] an injury of a branch of the radial nerve was followed, in a few days, by pain extending upwards along its course, and excessive tenderness over the spinal column; shortly afterwards, a new set of symptoms appeared, evidently connected with the vertebral tenderness, consisting of darting pains of the arms and thorax, and especially of the left mamma. These pains all vanished upon the appearance of the catamenia, and the spinal tenderness could no longer be detected; but it re-appeared as the menstrual period again approached, and was accompanied by the same train of symptoms as before. A course precisely similar was repeated for several successive months, except that the severity of the pains diminished as the wounded nerve recovered.

That the spinal irritation was in this instance the effect of the injury to the nerve, appears certain, from its supervening soon after the accident, growing less and less apparent as the wound healed, and finally disappearing, without any remedy to the spine.

It is probable, had the nerve been divided above the injury in this case, that the spinal tenderness, and the neuralgia emanating from it, would have instantly vanished. This conclusion seems warranted by the results which have followed the division of wounded nerves, under similar circumstances.

The following passage from Ludwig will show that he was well acquainted with the spinal irritation and the nervous pains connected with it, proceeding from disorders of the intestinal canal.

He says, "We must speak of colic pains, which affect not only the colon, but also the other intestines with troublesome tension; for the mesenteric plexus, in descending along the aorta, are so fixed to the spine of the back, that they appear as if agglutinated to it anteriorly, so that not only do they occasion wandering spasms in various parts of the intestinal canal, but involve also the lumbar portion of the spine; and it often happens, that the neighbouring sides become painful, whilst the spasms ascending to the chest and ribs, frequently simulate pleuritic pains, which, however, are instantly allayed when the cause of the intestinal spasms has been removed by fit remedies."[2]

[1] See Case VIII.

[2] "Dicamus autem primum de colicis doloribus, quippe qui non solum zonam coli, sed reliqua quoque intestina tensionibus molestis afficiunt. Plexus enim mesaraici, ad aortam descendendo, adeo ad spinam dorsi

Dr. Greaves has given a striking example of the occurrence of spinal tenderness in consequence of gastric disorder, where both affections were cured by means of remedies applied to the epigastrium.[1]

The dependence of spinal irritation upon affections of other organs, is sometimes less apparent where a careful examination is nevertheless sufficient to demonstrate it. The investigation should not be regarded as completed, even when the nervous pains have been clearly traced to irritation of the corresponding portion of the spine; but, in every case, the whole length of the vertebral column should be examined. By observing this rule, similar tenderness will often be detected over some other portion of the spine, where it is evidently dependent upon visceral derangement or external injury. There is, therefore, the primary disorder, causing irritation of the portion of the spinal column immediately connected with it; subsequently the communication of the irritation to other parts of the spine, and the neuralgic paroxysms emanating from the latter. That the whole of this train of symptoms is intimately connected, may be shown, by pressure over the lower portion of the spine sometimes exciting pain in the dorsal or cervical regions, or (which is more common) occasioning the neuralgic paroxysms. Further proof of this connection is afforded by the disappearance of the spinal irritation and the nervous pains, when the treatment is directed solely to the relief of the primary disease.[2]

The spinal tenderness, however, does not always subside upon the removal of the disorder in which it originated, nor does the neuralgia always cease when the irritation which was its central source can no longer be detected; but, under each of those circumstances, the symptoms are generally mitigated, and are reduced to a condition more favourable to the action of remedies.[3]

With regard to the frequency of neuralgia from spinal irritation, my opinion does not coincide with the experience of some recent authors, for, in the majority of cases, I have not been able to detect any sign of tenderness over the vertebral column; I have the authority of Dr. Alison for stating, that he has arrived at the same conclusion.

Neuralgia from organic diseases of the brain and spinal marrow.—The species of neuralgia most commonly observed, in connection with structural diseases of the brain, is that of the cere-

adhærent, ut eidem anterius quasi agglutinati videantur, ideoque non solum vagos spasmos in variis tubi intestinalis partibus efficiunt, sed spinam dorsi lumbarem, etiam in consensum trahunt. Sæpius ita accidit, ut vicina latera simul dolerent, et spasmi ad thoracem, et costas ascendendo, pleuriticos sæpe dolores mentirentur, qui tamen protinus compescuntur, quando causa spasmorum intestinalium, idoneis remediis discussa est.—Ludwig Adversaria Medico Practica.

[1] London Med. and Sur. Journal, vol. iii.

[2] Cases xii and xiii.

[3] Cases xiv and xv.

bral nerves, of which several examples have been recorded by authors. But it is by no means unusual to observe other forms of the disease depending upon this origin. Sometimes the pains are felt in the region of the stomach or liver, or some other internal organ, whilst the cerebral symptoms are either altogether absent, or are so slight, that they are regarded as merely of a secondary character. In other cases, neuralgic pains of an external organ, occupying a limited surface, or darting in the course of a nervous filament, form the chief or only symptom, although the subsequent history has proved the existence of organic disease of the brain.[1]

Andral observed a case, where nervous pain of the extremities was the only symptom during several months, of what was subsequently proved by dissection to be softening of the brain.[2]

It is well known, that nervous pains of the trunk and extremities commonly attend the progress of organic affections of the spinal column, which, in the earlier stages, is often the only complaint for which the patient seeks to be relieved.

A patient in Bartholomew's hospital, complained of severe pain of the knee, which proved so obstinate, that amputation was performed. Some years afterwards, an opportunity of examining the spine was afforded, when thin plates of cartilaginous and bony deposits, were found in the posterior surface of the cord.[3]

In Gregory's[4] case, the progress of the spinal disease was very insidious, the principal symptoms being lancinating pains of the extremities, and even these were for several months entirely suspended. Subsequently, when fulfilling his duties as a watchman, he received a slight injury; upon which the nervous pains were instantly renewed, and were now attended by other symptoms, more clearly indicating the existence of organic disease. The post mortem examination exhibited a portion of the spinal marrow in a softened state.

Neuralgia from malignant diseases.—The dreadful lancinating pains which attend the progress of malignant disease, appear to be of the nature of neuralgia, and may sometimes be temporarily relieved by the mode of treatment found most efficacious in that affection.

Neuralgia from chronic inflammation.—Neuralgia may also appear in parts affected with chronic inflammation. The paroxysms are often observed to be periodical under such circumstances, and the pain is perfectly distinct, and of a different character from that which ordinarily attends chronic inflammatory affections. On this subject, Dr. Alison remarks, "These pains, although hardly ever observed during violent inflammatory diseases, are by no means

[1] See Abercrombie, Pract. and Pathog. Research, on Dis. of the Brain and Spinal cord, p. 324.

[2] Andral, Clinique Médicale, vol. v.

[3] Mayo's Pathology.

[4] Case xvi.

incompatible, but, on the contrary, frequently combined with such inflammation as is subacute or tends little to disorganisation in the parts where they occur. Even in that case, however, they retain their character in some degree, and are benefited only partially by the antiphlogistic, and often chiefly by the more specific remedies subsequently used."[1]

Neuralgia from syphilis.[2]

Neuralgia from rheumatism.[2]

Neuralgia from inflammation of nerves.[2]

Neuralgia from malaria.—In consequence of the striking resemblance between the phenomena of neuralgic paroxysms and those of ague, Van Swieten used the name of febris topica, which he supposed to be of a nature similar in every respect to intermittent fever, differing only in the amount of morbid action, which in the one case is confined to a single spot, whilst in the other the whole system is under its influence.[3]

Sauvages, in his nosology, describes a species of sciatica, which he calls ischias intermittens. This species, he says, arises from the same cause as agues, and assumes the same types.

The same opinion is clearly expressed by M. Coquereau, who published the history of a periodical headache that prevailed in Paris in 1778.[4] These headaches, he remarks, are nothing more than local intermitting fevers, arising from the same cause as ordinary intermittents, and requiring a similar treatment.

The late Dr. Macculloch, who investigated the subject of malaria with great ingenuity and success, was of opinion, that by far the greater number of neuralgic cases originated from that source, and that the poison is frequently generated in localities where its presence has never been suspected.[5]

Among the facts which are supposed to prove the agency of this cause in the production of neuralgia, the following are worthy of particular notice:—the disease is very prevalent in marshy districts; the paroxysms are sometimes observed to commence with a sensation of cold, either general or local, which is succeeded by an elevation of the temperature of the affected part; they often return with the greatest regularity at stated periods, assuming the types common to intermittent fevers. Neuralgia frequently co-exists with ague in the same individual, and sometimes alternates with it; and the same mode of treatment is applicable to both affections.

The periodical character alone cannot, however, be relied upon as establishing the miasmal origin of neuralgia, for this tendency is also observed in cases which have obviously no connection with malaria. The explanation of the phenomena belongs rather to the

[1] Alison's Outlines of Pathology.

[2] See Pathology of Neuralgia.

[3] Van Swieten, l. c.

[4] Histoire de la Societé Royale de Médicine.

[5] Macculloch on the Production and Propagation of Malaria.

general theory of nervous action, than to any thing specific in the nature of the exciting cause.

John Hunter relates two cases of severe pain of the side of the face, in which the paroxysms were perfectly regular, although the disease was afterwards found to depend upon a dens sapientiæ piercing the gum.[1]

Dr. Darwin, speaking of hemicrania, says, "A remarkable circumstance attends this kind of headache, viz. that it recurs by periods, like those of intermittent fevers; these periods correspond with alternate lunar and solar days, and that even when a decaying tooth is evidently the cause, which has been evinced by the cure of the disease by the removal of the tooth.[2]

The same tendency to assume a periodical type, has been remarked when the disease arises from an injury of the nerve itself, or from its pressure in consequence of an aneurism or tumour; in organic affections of the brain, &c.

Neither can it be adduced in proof of the malarious origin of neuralgia, that the paroxysms commence with a sensation of cold, either local or general; for this symptom also is often present when the disease arises from other causes.

The disease may, however, be suspected to originate from this cause, when it appears as an endemic in marshy districts, or even when it occurs in insulated dwellings, situated in the vicinity of marshes, stagnant waters, or of sluggish rivers and canals; or when the patient has visited, or even passed through a malarious district, and when the disease appears or renews its attacks in spring and autumn.

Neuralgia from anæmia.—An insufficient supply of the circulating fluid has already been mentioned among the predisposing causes of the disease, but there can be no doubt that in some cases it must be regarded as the exciting cause. It has been well ascertained, that when an organ is deprived of its due quantity of blood, its functions become disturbed, and, among other symptoms, pain may be excited. Thus, when an artery has been tied for aneurism, the parts to which it conveyed blood often become extremely painful; after hemorrhages, violent pains frequently arise in different parts of the body, sometimes simulating inflammation of a vital organ. It is probable, also, that the wandering pains that are so common in chlorotic cases may arise from a similar cause; namely, a deficiency of the circulating fluid, which is one of the most remarkable characters of that disease. This opinion derives further support from the sufferings being generally alleviated by remedies that have a tendency to give tone to the circulation, and to induce a plethoric state of the system.[3]

When epilepsy, hypochondriasis, hysteria, &c., accompany neu-

[1] John Hunter. Natural History of the Human Teeth.
[2] Darwin's Zoonomia.
[3] See Dr. Marshall Hall, on the effects of Loss of Blood.

ralgia, they cannot be regarded as its exciting cause; for these diseases, as well as neuralgia, are equally the consequence of morbid action in some portion of the nervous system, and may all result, either separately or in combination, from the same cause.

For instance, when an injury of a nerve excites pain along its course, and terminates in a paroxysm of epilepsy, or when disorder of the uterine functions occasions symptoms of neuralgia, together with that peculiar nervous excitement which is termed hysteria,—in these cases, and in every other where this complication is observed, there must exist some previous source of irritation, to which all the symptoms may be referred. There is, in fact, no more reason for believing that the epilepsy or hysteria is the cause of the neuralgia, than that the latter is the source of those other nervous affections.

Seat of neuralgia.—The remarkable precision which neuralgia often observes, in following the course of a nervous branch, sometimes through all its ramifications, naturally suggests the opinion, that it proceeds from some disorder of the nerve itself; and this view is further supported by the nature of the pain being similar to that occasioned when a nerve is irritated.

That it is a disease strictly confined to the nervous system, is confirmed by several pathological observations. It is produced, whenever a stimulus is applied to a sentient nerve, either at its origin, or in any part of its course; it may be occasioned by certain causes which act solely upon nerves without implicating any other tissues, such as a tumour pressing on a nerve; whilst the same causes do not excite the disease, when applied to any tissue except the nervous, unless the irritation be continued long enough to be communicated to the latter. Lastly, the section of a nerve affected with neuralgia, under favourable circumstances, is immediately followed by the cessation of the pain, which is again renewed when the two extremities of the divided nerve reunite.

The nerves most affected with the disease are those which are commonly classed as nerves of sensation, namely, the ganglionic portion of the fifth pair of cerebral nerves, and those which arise from the posterior column of the spinal cord.

Previous to the experiments of Sir C. Bell,[1] for the purpose of illustrating the functions of the portio dura of the seventh pair, neuralgia of the face was generally supposed to be an affection of that nerve. But that physiologist has proved, that the functions of this division of the seventh pair are chiefly connected with muscular motion, although many practitioners of eminence still doubt whether this nerve may not occasionally become affected with the disease; and by some this opinion is strongly maintained.

It is, indeed, perfectly consistent with physiology, that the portio dura may, to a certain extent, become a nerve of sensation, upon the application of an irritant, for Sir C. Bell has observed, that

[1] Bell. Exposition of the Natural System of the Nerves.

"branches of the fifth, or sensitive nerve, join and incorporate with the portio dura, so that the nerve, when cut anterior to this juncture, must exhibit signs of sensibility." How far this sensibility may be augmented by disease, appears to be still undecided.

Several cases have been published, where the pain seemed to follow the course of the portio dura, and was, moreover, accompanied by convulsive twitchings of the facial muscles, and in some instances, by their paralysis; facts which prove at least that the functions of this nerve were disturbed.

A lady, aged forty, had experienced for several months intolerable pains in the right side of the lower jaw, which where exasperated towards night: these pains commenced at the stylo-mastoid foramen, beneath the ear, and extended over the corresponding side of the face to the mouth, which was then affected with slight spasmodic twitchings. The pain was similar to that occasioned by striking the ulnar nerve at the bend of the elbow, and seemed to stretch from the trunk of the facial nerve to its most minute filaments. The right commissure of the mouth was slightly drawn outwards and upwards.[1]

A lady, aged thirty-seven, suffered acute pain in the gums, which was attributed to decayed teeth. The painful sensation commenced at the point where the facial nerve emerges from the stylo-mastoid foramen, and extended to the temporal region—the cheek, the lips, and the upper part of the neck. The mouth was slightly turned towards the affected side.[2]

These cases (to which others might be added) are considered by the authors who observed them, as examples of neuralgia of the portio dura; but there is reason to doubt the accuracy of their diagnosis, which is considerably weakened by a case of this kind mentioned by Thouret, where the pains apparently followed the ramifications of the portio dura, commencing at the stylo-mastoid foramen, and spreading over the cheek. With the hope of effecting a cure, the facial nerve was divided at its exit from the cranium, but no mitigation of the sufferings followed; and the only result of the operation was paralysis of the muscles of that side of the face.[3]

It must, therefore, still be considered doubtful, whether this nerve is capable of being affected with neuralgia. The onus probandi certainly rests upon those who maintain the affirmative, because their opinion is contrary to what might naturally be concluded from the acknowledged functions of the nerve.

May not the portio dura, which forms connections in the muscular parts with the extreme branches of the fifth nerve, become the medium for the communication of neuralgia to the sentient nerves of the face from an irritant applied to it, in the same manner

[1] Piorry, Clinique Médicale.

[2] Ribes, Observation de Névralgia du Nerf Facial. Magendie's Journ. de Physiol. vol. ii.

[3] Histoire de la Societé Royale de Medicine, vol. ii.

that the great sympathetic transmits to sentient nerves the irritation which originates in disorders of the primæ viæ?

It is still disputed, whether the sympathetic nerve and its ganglia are endowed with sensibility, and, consequently, whether visceral neuralgia is an affection of that system of nerves, or of the cerebro-spinal. From the experiments of Haller, it would appear that irritation of the ganglionic system induces obscure signs of sensibility, although of a kind infinitely below that manifested when a branch of the cerebro-spinal is touched.

Bichat says, "I have watched that state which succeeds the agitation caused by the incision of the abdominal parietes, then I have laid bare the semilunar ganglion, and have strongly irritated it; the animal was not agitated: whilst as soon as I irritated a cerebral or lumbar nerve, he cried, struggled, or attempted to rise."[1]

This celebrated physiologist, however, believed, that in a morbid state the sensibility of the ganglionic nerves becomes considerably increased, and that they are the seat of certain colics which constitute the real neuralgiæ of the nervous system of organic life.

Magendie has taken a very different view of this question; he observed, in the course of his physiological experiments, that the sympathetic ganglia were cut and irritated without any manifestation of suffering by the animal. He therefore concludes that these ganglia do not possess sensibility, and even denies their right to be classed as forming any portion of the nervous system.[2]

A series of vivi-sections, for the purpose of elucidating the functions of the ganglionic nerves, has recently been instituted by M. Brachet,[3] in which the question as to their sensibility was made one of the subjects of enquiry.

He found that the sympathetic ganglia and the filaments which proceed from them, might be repeatedly pricked, without any sign of suffering being shown by the animal, but when the irritation was continued until the ganglia became red and inflamed, that acute pain was then produced by every puncture; that when a ganglion had been thus irritated and rendered sensible, its sensibility was again destroyed by the section of the nerve which connected it with the spinal marrow; but if the irritation were renewed after the lapse of a few minutes, the ganglion was found to have regained its sensibility; of which, however, it was finally and completely deprived by making a section of the nerves of communication passing between it and the ganglia situated immediately above and below it; that when a ganglion had been excited to sensibility, subsequently to the section of its spinal branch, it was permanently deprived of this property, by dividing the nervous twigs passing from the spine to the two ganglia, situated immediately above and below that where the irritation was applied.

[1] Bichat, Anatomie Genérale, translated by Caffyn.

[2] Magendie, Precis Element de Phys.

[3] Recherches, Exp. sur les fonctions du Syst. Nerv. Ganglion.

So far, therefore, as experiments of this nature may be relied upon, the following conclusions may be deduced as applicable to neuralgic affections, viz.—

That the ganglionic system of nerves are insensible to mechanical irritation in their healthy condition, but that they acquire sensibility when in a state of inflammation or excitement, and that they do not possess this function at all, independently of their connection with the cerebro-spinal system.

It is, however, difficult to reconcile these facts with certain phenomena of continual occurrence, where impressions pass with amazing rapidity from one of those systems to the other; as when nausea is excited by the sight of disgusting objects; involuntary dejections in consequence of fear; or when the strength is suddenly prostrated by a blow over the abdomen. Instances are not wanting, either, where the swallowing of acrid ingesta has been immediately followed by pain, not only of the stomach, but of organs deriving their nerves from the brain or spinal marrow.

Beclard explains this apparent anomaly, by supposing that mechanical or chemical irritations do not pass along the ganglionic nerves, but that galvanic irritation is conducted by them and determines sensations and contractions.[1]

Little has hitherto been ascertained respecting the pathology of the sympathetic nerve; it has been but rarely observed with unequivocal marks of disease. In some instances, however, cases of this kind have been met with, where the functions of the organs in connection with the diseased ganglion were disturbed, and sometimes visceral pains were excited; whilst in other cases of this kind this symptom was altogether absent.

Of the pathology of neuralgia.—We possess no certain knowledge of the abstract nature of neuralgia, being acquainted with it only by its effects; it may be defined a preternatural elevation of function in one or more sentient nerves, without corresponding excitement in the vascular, or of the great mass of the nervous system.

It was supposed, by Dr. Fothergill, to be connected with a cancerous diathesis, an opinion which experience has proved to be totally unfounded. The theory of the syphilitic nature of neuralgia is equally untenable. Cases undoubtedly occur from the absorption of venereal virus, but it is more probable, if the history of that affection be considered, that the symptoms proceed from the changes, which it effects in the structure of parts, such as periostitis, nodes, enlargements, ulceration, &c., than that the nerves themselves become affected by the poison.

The identity of one form of neuralgia and rheumatism is maintained by some modern pathologists, who conceive the latter to be neuralgia of the nervous filaments of the joints;[2] but notwith-

[1] Beclard, Anatomie Génerale, translated by Knox.

[2] Jolly. Bulletin de la Societé d'Anatomie.

standing that there is a striking resemblance between these affections in many points, there are others in which they materially differ.

The case of Rushen[1] is an example of neuralgia of the joints. The situation of the pain, and its disposition to change suddenly to other joints, partook of the character of rheumatism; but the total absence of fever—the entire disappearance of the pain for certain intervals—the absence of heat or swelling in the affected part—the slight aggravation of suffering produced by the motion of the limb—seem to prove that the disease was confined to the nervous filaments, leaving the muscles unaffected.

Another proof of the distinct nature of these affections is furnished by the neuralgia supervening in the course of rheumatism, being distinguished from that affection by the usual lancinating character of the pain, by its periodicity, and by its removal through remedies which make no impression on the rheumatism; a curious example of which is given in the following case. A woman, aged 39, was attacked with acute pains in the shoulders, the left arm, and right thigh, increased by pressure and motion; the parts were slightly swollen and pale, the pulse quick, the skin hot, and there was much thirst. In addition to these symptoms, the patient was attacked every half hour with a sensation of numbness and thrilling pain, similar to that excited by striking the ulnar nerve at the elbow. The pain extended along the inner part of the arm, fore-arm, and hand, and was extremely severe. Leeches, blisters, morphia, and a variety of other remedies were employed without effect. Relying upon the intermitting character of this pain, the quinine was administered, by which the neuralgic affection was removed, although no impression was made on the rheumatism.[2]

Some authors have given the name of rheumatic neuralgia to this complication, a name which at least implies some difference in the nature of the neuralgia in these cases. May not the true explanation be, that these two complaints, when they coexist, stand towards each other in the relation of cause and effect, and that the neuralgia may occasionally be the result of the pressure of nervous filaments, in consequence of the swelling which accompanies rheumatism?

In addition to the foregoing facts, it may also be remarked, that neuralgia, in some instances, does not begin until the rheumatism has nearly subsided, and (as happened in Mr. Piorry's case) often occupies a different station, or extends beyond that of the rheumatism. For these reasons, I have ventured to assign rheumatism a place among the exciting causes of neuralgia.

Neuritis.—Neuralgia is believed by some authors to consist of inflammation of the nerves.

Larrey, speaking of tic-douloureux, describes it as "a chronic and inflammatory turgescence of the neurilema, which envelopes

[1] Case xvii.

[2] Piorry Clinique Médicale.

the nerves of the part affected.[1] Neuralgia, according to Descot,[2] is nothing more than a chronic neuritis.

"If the nerves are susceptible of inflammation," observes Montfalcon, "which it would be a medical heresy to deny, it is more than probable, it is indeed certain, that neuralgia is that inflammation." The same author remarks, that "the natural place of neuralgia, in a nosological arrangement, is among the phlegmasiæ."[3]

It is of the greatest importance to examine into the facts upon which these and other authors rely, in support of their views respecting the nature of the disease; and to ascertain whether it can be established as a pathological axiom, that neuralgia and neuritis are one and the same affection.

The circumstances connected with the general history of the disease supposed to favour this view, are: that its exciting causes are often of a description that are well known to induce inflammation of other organs, as exposure to wet and cold, contusions, external irritants, &c.; that the disease is generally seated in the superficial nerves, which are most exposed to the action of these causes; that the pain is often confined to the tract of a nerve or of nervous filaments; that it is increased on pressure; and that, occasionally, there is a tendency in the disease to spread along the course of a nerve, after the manner of some forms of inflammation.

To these arguments, however, it may be replied: that the cutaneous nerves are often the seat of the pains, from spinal or cerebral disorder, or from other causes not acting as direct irritants of the affected nerves—and, in fact, this is one of the most invariable characters of the disease; that although the pain is excited by the contact of a light substance, it is often relieved by firm pressure; and that it sometimes attacks a nerve, and follows its course with anatomical precision, when disorder of the primæ viæ is the cause of the disease.

Neither is it any evidence of neuritis, when the pain is observed to spread upwards in the course of the affected nerve, or when a wider circle of parts in connection with the nerve becomes gradually involved in the morbid action; for the same course is observed where there is sufficient proof that the nerve was not inflamed; a fact which is well illustrated by the following interesting cases of Mr. Wardrop.

In one case, which originated in pricking the forefinger of the right hand with a gooseberry thorn, these symptoms occurred. "The nervous paroxysms usually attacked her two or three times a day, and one of them always came on at the time of her rising out of bed. During these attacks, the pain extended along the finger to the back of the hand, and between the two bones of the fore-arm, darted through the elbow-joint, stretched up the back of

[1] Larrey on the Use of the Moxa.

[2] Descot, op. cit.

[3] Dict. des Sciences Medicales, art. Neuralgia.

the arm to the neck and head, producing a sensation at the root of the hairs, as if they had become erect."[1]

In another case from the same author, in consequence of an injury of the digital nerve, the pain extended up the arm to the neck and side. In the first of these cases, the finger was amputated; in the other, the nerve was divided above the injury; the operation was, in both instances, entirely successful, being instantly succeeded by the total subsidence of the symptoms. No trace of inflammation could be discovered in the nerve of the amputated finger.[2]

May it not be inferred, that, in the foregoing cases, the pains which occurred in the parts above the seat of the injury could have had only a sympathetic character, and were not dependent upon local inflammation?

In some instances, however, morbid anatomy has disclosed neuralgia connected with an inflammatory condition of the nerve. As an instance of this occurrence, the following case from Gendrin is selected.[3]

Andrew Dubourgh, wagoner, aged fifty-eight, entered the hospital with symptoms of pneumonia, which continued about four days; he complained also of acute pain in the right knee, numbness of the feet, and painful shootings along the course of the sciatic and external saphena nerves. These pains had preceded the attack of pneumonia four or five days; they had changed their seat several times, and had even attacked the opposite limb. The application of leeches, and a perpetual blister over the head of the fibula, procured slight relief. In the meanwhile, the pneumonia continued with undiminished severity; there was swelling of the foot and leg, which did not pit under the finger. The patient died on the eighth day after his admission into the hospital.

At the post mortem examination, the right sciatic nerve, from the lower fourth of the thigh, the tibial nerve, to the point where it passes between the gastronemii muscles, and the external saphena nerve, in nearly its whole course, were inflamed.

The inflammation was characterised by a slight redness with serous infiltration, and a moderate degree of tumefaction of the above nerves, particularly of the saphena nerve at its commencement. This nerve was at least double its natural size, of a uniform scarlet colour, and of a hard fleshy texture. In endeavouring to dissect the numerous fibres, both from above and below, towards this spot, they broke, and tappeared involved in a spongy cord, which was infiltrated with blood, and resistent to the touch; a section of this cord showed nothing but small coagula of blood. In contact with the inflamed saphena nerve, below the gastronemii, was a collection of pus, rather effused into the cellular membrane, then enclosed within an abscess, and not penetrating the substance of the nerve.

[1] Wardrop, Med. Chirurg. Trans. vol. viii.
[2] Ditto. vol. vii.
[3] Gendrin, Hist. Anat. de l'Inflammation.

The filaments of the sciatic and tibial nerves were separated and, as it were, dissected, by means of infiltrated serum, to a considerable distance both above and below the seat of the inflammation.

Similar cases of acute neuritis, giving rise to neuralgic symptoms, are mentioned by other authors, where the affected nerves were found redder than natural, indurated, thickened, with serum, blood, pus, &c., effused between their fibres.

But there is a manifest difference between attacks of this nature, sudden in their invasion, and rapid in their course, when compared with the usually slow progress of a neuralgic affection; which, if it really possess an inflammatory nature, must belong, in the great majority of cases, to the chronic form, a condition which the most experienced pathologists agree is rarely met with. This fact at once destroys the probability of its identity with an affection so common as neuralgia. In the following cases, however, collected from various authors, the disease appears to have arisen from chronic neuritis, or from some of the consequences of that disorder.

In a case of sciatica, detailed by Cotunnius, the affected nerve, from its origin to its termination, was found of a deeper colour than usual, and the neurilema was unusually thick, and contained a large quantity of serum.[1]

In the same affection, Cirillo found the sciatic nerve hardened to the density of cartilage.[2]

Bichat,[3] in a case of sciatica, discovered the vessels which entered the superior portion of the nerve in a dilated state. Rousset,[4] in a similar case, found a flaccid condition of the neurilema, and its veins varicose. Andral in one instance found this nerve enlarged.

Siebold[5] discovered an intercostal nerve, in which neuralgia had been seated, redder than usual, and much wasted.

Swan[6] found the median nerve, which had been affected with neuralgic pains, thicker than natural.

In the neighbourhood of ulcers which had been unusually painful, nerves have been found inflamed and thickened; and when neuralgic affections occur in the stump of an amputated limb, the nerves often present the same appearances.

These cases are valuable, inasmuch as they establish the fact of the occasional dependence of neuralgia upon chronic inflammation of nerves; but if they are employed to deduce any inference as to the nature of the disease, the most erroneous opinions must be arrived at. They are, in fact, rare exceptions to the common course of the complaint, which in general leaves no trace of its existence in the nerves which have been affected with it.

Desault examined two patients who had been affected with facial

[1] Cotunnius, De Ischiade Nervosa, 1770.
[2] Cirillo, Prakt. Bemurkung.
[3] Bichat, op. cit.
[4] Dict. des Scien. Med. art. Neuralgie.
[5] Table Synop.
[6] Op. cit.

neuralgia on one side only; but the nerves of both sides were found precisely similar.[1]

Several cases of neuralgia were examined by Martinet, where the nerves presented no morbid appearance.[2]

Andral made a careful dissection of the affected nerves in many cases of sciatica, but, except in one instance, already mentioned, the affected nerves presented their natural appearance. He also inspected the bodies of several patients who died of an epidemic that prevailed at Paris in 1828, the most remarkable symptom of which was excessive sensibility of the hands and feet. No trace of disease could be found in the affected nerves. The same pathologist dissected the body of a woman, who, during the latter months of her life, had suffered severely from pains of the occiput and side of the neck, which, Andral observes, had all the characters of neuralgia. The nerves of the axillary and cervical plexus were followed with the greatest caution throughout all their ramifications, and were found to retain their healthy appearance in every respect.[3]

Piorry examined the body of a patient who had been affected with acute pains in the left shoulder, which also extended over the left side of the thorax and down the arm to the fingers; the nerves of the brachial plexus and those of the neck were dissected with the greatest care, but no lesion could be discovered in them.[4]

These cases, which are selected from many others, are considered sufficient, from the total absence of morbid alterations in the structure of nerves which had been the seat of neuralgia, to afford presumptive evidence at least, that those parts were not affected with inflammation.

There are, moreover, some other phenomena connected with neuralgic affections, which it is difficult to reconcile with an inflammatory origin;—as their sudden commencement upon the application of an obvious exciting cause—a disordered stomach for example; their abrupt termination when that cause is removed; the total absence of febrile excitement, and often of redness or heat in the affected part; and the decided influence on them of remedies which cannot be supposed to relieve inflammation.

The general effect of inflammation on the nerves is to induce change of structure, by which they are subjected to a certain degree of pressure, which would prove a source of irritation amply sufficient to account for the symptoms of neuralgia, even in the absence of inflammatory action. In some cases the neuralgia is felt in a different portion of the nerve from that where the inflammation is seated; and sometimes it attacks another, and even a remote nerve, as in the case quoted from Gendrin. Moreover, the pains of

[1] Bichat, op. cit.
[2] Revue Médicale, 1834.
[3] Andral, Précis. d'Anat. Pathol., vol. ii.
[4] Piorry, op. cit.

neuralgia and those usually observed in neuritis are distinct, the latter being dull and constant, the former lancinating and paroxysmal. These considerations have induced me to class neuritis and its sequelæ among the exciting causes of neuralgia, instead of assigning to this affection an inflammatory nature.

It has been supposed, that whatever may be the origin of the disease, the affected nerves are in a state of hyperæmia during a neuralgic paroxysm. This opinion has arisen in consequence of the skin over the affected nerve being sometimes observed to change into a deep red colour during the attacks. But when this process is carefully watched, it will be found that the colour becomes deeper as the pains grow more intense, and that when this local action of the vessels is greatest, the paroxysms begin to subside, and the skin gradually to assume its natural appearance. It is plain, therefore, that this symptom ought not to be regarded as the cause of the paroxysm, but, on the contrary, as the consequence of the irritation occasioned by the pain—in accordance with the medical axiom, ubi stimulus, ibi fluxus.

It may be here again enquired:—Is neuralgia a disease or merely the symptom of a disease? It certainly is as much so as many cases of epilepsy, chorea, hysteria, &c., denoting equally with them, that a portion of the nervous system is in a state of morbid excitement. It cannot be considered of the same nature, or merely an aggravation of the pain commonly attending disease, but as something superadded to it, and that does not necessarily arise, even in the most aggravated affections. Indeed it is rarely observed in, if it be not altogether incompatible with the existence of, acute inflammation; and it is remarkable that the most distressing cases are often dependent upon causes apparently insignificant; whilst in many instances no morbid appearance can be discovered to account for the symptoms. When neuralgia arises from a cause which is from its nature permanent, it often disappears for considerable intervals, and requires a very different mode of treatment from that which is desirable in the disease with which it is connected; and when it originates in some accidental and transient circumstance, the pains are often continued long after every vestige of the primary affection has disappeared. Whether it can ever be excited without the intervention of a local cause, is a question to which it is impossible to give a satisfactory answer: and when it is remembered that the most excruciating neuralgia may be produced by a substance not larger than the head of a pin; by the dilatation of a vessel pressing upon its accompanying nerve, or of those which enter the nervous substance, or other slight derangements, probably disappearing soon after death, what anatomist will venture to assert that no such lesion had existed?

Pinel observes, "Differentes observations semblent devoir faire conclure que dans la nèvralgie il exist une cause materielle d'irritation fixée sur le nerf, que cette cause n'est pas la même dans tous

les cas, et qu'ainsi il faut la connaitre pour etablir un traitement efficace."[1]

These cases, where the disease remains unchanged after its original exciting cause had apparently ceased to act, may be imagined to furnish examples of neuralgia occurring independently of local causes; but here, also, it may be presumed that the local morbid action of the nerves has been communicated to the blood vessels, and that some irregularity in the cutaneous circulation has been induced, so as to keep up the disease. The presence of œdema over the affected part, shows that the capillary circulation is disturbed in some instances, and the lancinating pains which precede the eruption of herpes zoster, seem capable of explanation on the same principle.[2]

When the disease arises from causes acting as depressants or excitants of the whole system, such as malaria, anæmia, &c., and totally disappears under the use of general and tonic or stimulating remedies, as bark and steel, it may seem to possess a constitutional origin; but nothing is more likely to occur, under the action of these causes, than local congestion, a condition sufficient to account for the symptoms, and which the class of remedies alluded to would probably remove.

It has been supposed, also, that the tendency so often observed in neuralgia to wander from one organ to another—no sooner being subdued in one part, than appearing in another—indicates the presence of some cause, equally active in all parts of the body; and that these cases at least should be regarded as having a constitutional and not a local origin; but a little consideration will show the fallacy of this reasoning; for there is the same disposition of the disease to change its seat, where the cause is well ascertained to be strictly local, such as a decayed tooth, an aneurism, &c., and as has already been observed, the pains often fix upon an organ placed under any inordinate conditions of excitement or depression.

The manner in which the irritation is conveyed in such cases, from one organ to others more or less remote, is not always discernable; in some instances, it is traceable by successive steps along the spinal marrow, occasioning tenderness over different portions of that substance, and converting it into a focus, from which the pain radiates along the nerves; in others, the brain forms the centre of communication, whilst in some cases, the pain simply passes to other ramifications of the nerve originally affected.

If an analysis be made of the exciting causes, with the view of ascertaining the species of irritation upon which neuralgia depends, the results thus obtained are not uniform, although in the greater number of instances they appear capable of being reduced to mechanical irritation, directly applied to some portion of the nervous

[1] Pinel, Nosograph. Philosoph. vol. iii.
[2] See Travers on Constitutional Irritation.

system, as tumours, enlarged organs, bony spicula, aneurisms, thickening of nerves, effusions beneath their neurilema, &c.

There are others, in which the presence of such irritation may be rationally suspected, although it cannot be so easily demonstrated; as in morbid action of the heart; in anæmia; and in other conditions which have a tendency to induce topical congestions of the various organs, and thus, directly or indirectly, to become a source of mechanical irritation.

Diagnosis.—The symptoms of neuralgia are, in general, sufficiently characteristic of the disease. It may sometimes, however, be mistaken for other painful affections, as rheumatism, neuritis, &c., and, when seated internally, for visceral inflammation.

From rheumatism it may be distinguished by the nature of the pain, which in that affection is gnawing or pungent; whilst in neuralgia it is lancinating or thrilling; by the duration of the pain, which in rheumatism is either continued or remittent, but in neuralgia is intermittent or periodical; by the effects of pressure, which in rheumatic affections greatly aggravates the sufferings, but often relieves them in neuralgia.[1]

It may be distinguished from acute neuritis, by the absence of fever; by the duration of the complaint; by the pains of the neuritis being greatly aggravated by pressure in the course of the nerve; and by the nerve itself, when situated superficially, being found thickened and prominent.

It is not so easy to distinguish neuralgia from chronic neuritis; but the extreme rarity of the latter affection renders the diagnosis a matter comparatively of little consequence.[2]

The most important part of this subject is, to consider the signs which distinguish internal pains of a neuralgic nature, from those which proceed from inflammation. It is needless to remark, that a mistake on this point might endanger the life of the patient, and would be ruinous to the reputation of the practitioner.

Happily, in the greater number of cases, a little attention will suffice to distinguish these affections; the absence of febrile excitement; the severity and intermitting character of the pain; the effects of firm pressure; and especially the tendency to change from one internal organ to another; or to alternate with nervous pains of an external organ; are generally sufficient to evince the true nature of the disease.

But there are cases, in which the diagnosis is far more difficult; where the pain is fixed, and increased by pressure; and the pulse is as much excited as in visceral inflammation. But even in these cases the experienced practitioner is struck with something remarkable in the symptoms; thus, the tongue may remain clean and moist, and the appetite good; or the pain may be diffused over a larger surface than is generally affected in inflammation. There may be symptoms of general nervous irritation; and often, when

[1] See page 219. [2] See page 220.

the patient's mind is diverted from his complaint, pressure over the affected organ may be made with impunity.

Another method of distinguishing these affections has latterly been advanced; namely, that when internal pains have a neuralgic origin, in nearly every case there will be found tenderness over that part of the vertebral column which has a connection, by means of nerves, with the affected viscus; but that when the symptoms depend upon inflammation, this tenderness is in no case observed.

After a careful examination of a large number of cases, I feel justified in remarking, that this diagnostic sign cannot be trusted with safety. It is entirely absent in many cases of visceral neuralgia; nor does the second branch of the diagnosis hold good in all instances; for in some cases of chronic visceral inflammation, unattended with disease of the spine, tenderness over the vertebral column is present; as in the following case.

A plethoric woman, aged thirty-eight, complained of acute pain in the right hypochondrium, aggravated by pressure; the pulse was quick and small, and the cheeks covered with a hectic flush; there was extreme tenderness over the seventh and eighth dorsal vertebræ, and pressure over this spot occasioned an aggravation of the pain of the right side; soon afterwards, she experienced a sensation of something bursting internally, and at the same moment, the pain of the side ceased, and a large quantity of purulent matter was afterwards passed by stool.

It must be admitted, however, that this diagnosis is very often so difficult, as to make it desirable to assist it by a cautious trial of the remedies for inflammation, closely watching their effects, and the subsequent progress of the disease.

Prognosis.—As a general rule, the prognosis in neuralgia is favourable as to its fatal tendency, and unfavourable as to its duration. The nature of the predisposing and exciting causes must chiefly be considered, in giving an opinion on this subject; when these are of an evanescent nature, the neuralgia also may be expected to pass away quickly; but when the disease proceeds from a cause either permanent or liable to perpetual renewal, the prognosis should be given accordingly. It is necessary to remember, however, that neuralgia is very likely to return, when it has once attacked a patient; and, therefore, on this point it is best to give a guarded opinion. The disease usually disappears, or at least becomes greatly mitigated, in the later periods of life.

Treatment.—It would be difficult to mention a pharmaceutical substance endowed with any energy, that has not, at some period, been supposed to possess a specific power in the cure of neuralgia. This reputation has been successively appropriated to medicines of the most opposite qualities, without regard either to the origin of the symptoms or the condition of the patient. It is no wonder, in a practice so empirical, that disappointments frequently occurred; until at length unbounded confidence in the efficacy of a remedy became changed into the opposite extreme of unmerited neglect.

Another source of error, in estimating the value of a remedy in neuralgia, exists in the natural tendency of the disease to intermit, and sometimes to disappear for long intervals; this spontaneous cure may be mistaken for the effects of treatment; and the same circumstance also largely contributes to the remarkable discrepancy of opinion formed by different practitioners, regarding the effects of a particular medicine.

But it is by a careful and patient investigation of the causes and habitudes of this dreadful malady, rather than by the introduction of a new remedy, that any improvement in the manner of treating it is to be hoped for. In too many instances, no grounds for a rational treatment can be discovered; the following attempt to arrive at that object, I feel and acknowledge to be very imperfect.

With reference to its exciting causes, neuralgia may be divided into—

I.—Cases where the symptoms continue after the original cause has ceased to exist.

II.—Cases arising from functional disorders.

III.—Cases occasioned by causes of an irremediable nature.

IV.—Cases where the cause cannot be ascertained.

I.—Under the first class, are included those cases of neuralgia which can be traced to causes that have already disappeared; as when the pains continue after the subsidence of a cutaneous eruption, the removal of a tumour, the extraction of a tooth, &c. These cases generally yield rapidly to remedies which act powerfully on the nervous system; to be presently enumerated.

II.—In the cases comprehended under this section, the first indication is to remove the cause upon which the disease obviously depends; until this preliminary treatment has been accomplished, the remedies which, in the first class of cases, often afford relief, will generally be of no avail, and may increase the severity of the symptoms. But when the original disorder has been removed, the pains frequently disappear without further treatment; or, at least, may now be removed by those remedies which had previously failed to make any impression on them.

III.—In this class are placed those unfortunate cases depending upon causes of an irremediable character; but even in these the nervous pains may be aggravated or calmed, according to the state of the disease with which they are connected.

The same remark is applicable to neuralgia accompanying malignant diseases; the sufferings, even in these wretched cases, may be lightened, and sometimes rendered comparatively mild, by first subduing any inordinate cause of excitement of the diseased organ, and subsequently administering the more specific remedies for neuralgia.

IV.—This section embraces those numerous cases where the cause of the nervous pains cannot be discovered, and where the practice must therefore be in a great measure empirical.

In a work like the present, it will not be necessary to dwell upon

the preliminary treatment; a few remarks on this subject may, however, be useful.

As neuralgia is, for the most part, a chronic disease, it is seldom necessary to adopt the antiphlogistic treatment; but where the patient is plethoric, or where there is febrile excitement, it may sometimes be employed with advantage. In a case of sciatica occurring in a plethoric man, for which I had tried various remedies during several weeks, the symptoms were materially alleviated by a single bleeding; but, in general, this practice gives no relief, and indeed the symptoms are often aggravated by its employment.

It may sometimes be necessary to prescribe blood-letting for persons of a full habit affected with neuralgia, as a precautionary measure, before the administration of tonic or narcotic remedies can be ventured upon with safety.

Great benefit is frequently derived from local bleeding, by cupping or leeching. The latter, particularly, is of essential service in many cases, where the pain is attended by heat or swelling, or where the affected part is more than usually irritable.

When the disease attacks patients in a debilitated state, an opposite plan of treatment should be adopted, and remedies administered for the purpose of strengthening the system, and invigorating the circulation. Care should be taken, however, to avoid overloading the stomach with tonic remedies, which often produce an effect opposite to that which was intended.

This class of remedies ought not to be prescribed indiscriminately, nor without examining into the cause of the complaint: where there is considerable cerebral disturbance, they are obviously contra-indicated, and their exhibition might be followed by apoplexy, to which there is an evident tendency in some cases, especially of facial neuralgia.

In neuralgia dependent upon cutaneous eruptions, relief may often be effected by touching the vesicle or pustule with lunar caustic. In herpes zoster, for instance, I have succeeded in removing the severe neuralgic pains almost instantly by this means. Sometimes, in these cases, one or two vesicles are pointed out as the chief source of the suffering; but, in general, it is better to apply the caustic to the whole of each group, or to cover them with a strong solution of this substance.

When the disease proceeds from the irritation of an old cicatrix, it may sometimes be removed by the same treatment. M. Verpinet mentions a case of a lady, who received a wound of the arm from the point of a sword; violent neuralgic pains subsequently attacked the arm and wrist, shooting to the extremities of the fingers. After trying various means, the cicatrix was touched with the actual cautery; a slough came away, and the pains ceased entirely.[1]

I have found this plan of treatment useful in several cases, although the pains are very apt to return when the effects of the

[1] Journ. de Méd. vol. x.

caustic begin to disappear. It is best, not only to touch the cicatrix itself, but also to insulate it from the surrounding skin, by a circle of caustic. A very remarkable circumstance may sometimes be observed when the insulation is incomplete;—the pains being checked in their usual progress, shoot through the opening thus left for them, and attack the neighbouring parts.

Sometimes a permanent cure may be obtained by removing the cicatrix by a surgical operation. I am indebted for the following case, where this operation was successfully performed, to the kindness of Mr. H. Taynton.

Miss P. in January last, by a slip of the knife in carving, cut the extremity of the fore-finger; the wound healed rapidly, leaving a cicatrix more than usually indented. Soon after, severe pains commenced about the spot; which subsequently extended along the palmar aspect of the arm, to the bend of the elbow, and were aggravated in paroxysms. Pain was also felt on pressure in the situation of the cicatrix. After a trial of various remedies without the least benefit, Mr. Taynton, in the month of April, removed the cicatrix with the knife. From that time the patient has been entirely free from all pain. The wound from the operation healed quickly.

It has already been stated that an injury received a long time previous to the appearance of the neuralgia, is sometimes its unsuspected cause; and, in obscure cases, a strict enquiry upon this point may lead to the discovery of such a cause, and to a successful mode of treatment. Thus, a spot exquisitely tender under pressure may be found, which is sometimes (especially when seated in the scalp) swollen and puffy. At other times, however, this same spot may be pressed and examined without the excitement of pain. In Hawker[1] this circumstance was very remarkable; for sometimes the injured portion of the scalp had no unnatural tenderness, whilst at others the examination induced exquisite suffering; and upon one occasion a paroxysm of epilepsy ensued. The application of caustic or blisters over the seat of the injury is sometimes useful; but when those and other common means of relief have failed, a crucial incision over the part may be tried with advantage. A case of this kind has already been mentioned, where Pouteau adopted this practice with complete success.

When the disease is occasioned by a small sub-cutaneous tumour, the only remedy is to remove it, which in most cases can be done without difficulty. The operation consists in making an incision around the tumour, and afterwards separating it from its connections.

When the tumour is connected with the trunk of a large nerve, the operation of removing it is much more hazardous.

Supposing (observes Mayo) "the remedies by which swellings

[1] See Case IX.

are dispersed to have been properly but ineffectually tried, there remain the following measures:

"The exposure of the tumour, which if separable from the surface of the nerve, or from the body of the nerve, at the expense of a few fibres, should be removed, whether solid or a cyst; if completely implicated with the whole structure of the nerve, and that nerve a small one, it should be removed with the portion of the nerve involving it; if so implicated, and the nerve the sciatic, and the tumour a cyst, the cyst might be punctured, and the fluid evacuated, every precaution being subsequently taken to unite the wound by adhesion, leaving the chance of the fluid not re-accumulating. In the last case, supposing the tumour to prove solid, another question might still arise—whether the nerve being first divided above the tumour, the latter would not admit of being dissected out of the so palsied nerve with more probability of safety to the patient, than if the nerve to be operated on were left in communication with the brain; of course, if, in such an operation, the tumour should be found to implicate the nervous structure, or to leave no separable and wholesome fasciculi, the operation must be abandoned."[1]

In neuralgia from spinal irritation, the indications are the same as those before mentioned in the general consideration of the disease. The original cause of the pains should be sought for, to the cure of which the principal treatment should be directed; but when the sufferings of the patient demand the adoption of some palliative mode of treatment, relief may sometimes be obtained by the application of blisters or leeches to the spine, even when the original affection is unaltered. By this means the nervous pains may be suspended for a short interval, which should be employed in restoring the functions of the organ, in the disorder of which the whole train of symptoms originated. When this precaution is neglected, there is reason to apprehend that the pains will, in the great majority of cases, sooner or later re-appear. In some instances, however, a single application of a blister or leeches to the tender portion of the spine, entirely removes the complaint.

Mr. Tate observed great benefit in several cases from the employment of friction with tartar emetic ointment over the spine, even in cases where common blisters had failed to relieve.[2]

When neuralgia is suspected to have a syphilitic origin, and will not yield to the common mode of treatment, the exhibition of mercury, so as to induce a moderate degree of salivation, may sometimes be tried with advantage.

Waton relieved two patients who had for some years suffered from facial neuralgia, arising from syphilis, by rubbing in mercurial ointment, so as to induce salivation.[3]

[1] Mayo's Outlines of Human Pathology.
[2] Tate on Hysteria.
[3] Journ. de Médicine, 1793.

The preparations of iodine may be found valuable in cases of this kind; I have also seen much benefit from the extract of sarsaparilla, taken to the extent of half an ounce daily, for several weeks. Sometimes, relief may be obtained in painful syphilis by the employment of nitric acid lotions and opiates.

Some practitioners rely chiefly upon mercury as a remedy in neuralgia even when no connection with syphilis is apparent. It was employed by the elder Frank, in the form of calomel, combined with antimony and musk. Several cases are published in the Medical Journals where its exhibition, either alone or combined with opium, was completely successful. In my own practice, I have been induced, in a few cases of inveterate neuralgia, to prescribe mercury, so as to induce salivation, but I cannot recollect a single instance where the symptoms were subdued by this treatment.

Mr. Scott has lately published several interesting cases, where the disease, in various parts of the body, was arrested by the application of the proto-ioduret, or deuto-ioduret of mercury, in the form of an ointment over the affected part. This mode of treatment generally occasions considerable irritation of the skin; when this effect is produced, its use should be suspended, and renewed after a short interval. By adopting this practice, Mr. Scott relieved several cases of neuralgia, where various remedies had previously been unavailing.[1]

When neuralgia assumes an intermittent, or even a well-marked remittent character, it is often subdued by the remedies found most useful in the cure of ague. Soon after the introduction of the bark into the materia medica, it was employed as a remedy for intermittent headaches, and is praised for its efficacy in those cases, by Morton and Van Swieten[2]. In modern times the quinine is generally substituted for the bark, and its utility in periodical neuralgia may be considered as fully established. This medicine is exhibited by the continental physicians in much larger doses than it is usual to prescribe it in this country. In many cases this practice seems to have been successful in arresting the return of the paroxysm, when smaller doses had failed. It has been frequently given to the amount of gr. x. four or five times a day.

Arsenic.—The form in which this medicine is usually exhibited is that of the liquor arsenicalis. It has been used much more extensively in neuralgic affections, since Dr. Fowler pointed out its efficacy in periodical headache.

Numerous cases are recorded, where a cure was effected by this medicine; and most practitioners of experience regard it as an important remedy in neuralgic affections. It is more particularly indicated, where the pains assume an intermittent or periodical type; but it has often been found useful in cases where the

[1] Cases of tic-douloureux and other forms of neuralgia.

[2] Van Swieten, op. cit.

paroxysms observed no regular form. I have tried it in several instances, and can add my testimony to its value.

The dose of this medicine, at the commencement, should not exceed five minims three times a day, which may gradually be increased to fifteen minims, observing the usual precautions, in suspending its exhibition when the poisonous effects begin to appear.

Nux vomica.—This medicine was praised by Linnæus, as a remedy for gastralgia, but until lately it has not been generally employed in neuralgic affections; I have been induced to place it among that class of remedies recommended in periodical attacks, because having employed it in a large number of cases, I am satisfied that it is more beneficial in intermittent and remittent neuralgia, than in other forms of the disease. I have treated three cases of ague successfully with this remedy.

Under proper precautions, it is, I think, one of the best remedies we possess for the cure of neuralgia; it seems to agree better with persons of the leucophlegmatic, than with those who have a strong nervous temperament; but it seldom fails to aggravate the symptoms, and to create much general irritation when given to hysterical females. The preparation which I have generally used, is the alcoholic extract, in doses of a quarter of a grain to one grain, three or four times a day. I have preferred this form, because it appeared to me rather less irritating than the strychnine, which, however, may be sometimes advantageously substituted for it.

Purgatives.—Whatever may be the cause of a neuralgic affection, it is highly important to exhibit purgatives, either alone or in conjunction with other remedies. In many cases, the symptoms disappear when a free evacuation of the bowels is procured. Rahn collected several cases, to prove the connection of nervous pains in various parts of the body with disorder of the bowels, and the importance of purgative medicine in their cure.[1] Latterly, Sir Charles Bell has strongly insisted upon the efficacy of this treatment, and has detailed five cases of facial neuralgia, where it was attended with complete success.[2] But, on the other hand, it is often, unfortunately, of no avail; and there are few protracted cases, where the patient has not been repeatedly subjected to this treatment by different practitioners.

Opiates.—Most practitioners condemn the employment of opium, or its preparations, in the cure of neuralgia, on account of the tendency of that drug to constipate the bowels, and to induce nervous irritability. Some, on the contrary, have highly commended it; the acetate of morphine was employed by Dr. Bardsley, of Manchester, who succeeded in effecting a permanent cure of several cases by its use.

I have frequently tried it, and occasionally with success, although

[1] Rahn, Mirum inter Caput et Viscera Commercium, 1771.
[2] Sir C. Bell, Clinical Lecture of tic-douloureux, Med. Gaz. 1836.

in general, the relief obtained was only temporary. It is no trifling advantage, however, in this disease, to obtain even momentary relief for the patient; and when opiates are known not to disagree with him, it would be cruel to withhold them in the height of the paroxysms.[1]

Datura Stramonium.—This medicine is now frequently prescribed for the cure of neuralgia, and several cases are recorded by respectable practitioners, where it produced beneficial results. Lentin exhibited the tincture in several cases of fascial neuralgia, in doses of four or five drops, every third hour; and found it more useful than any other remedy of which he had any experience.[2]

Dr. Marcet cured two cases of severe chronic sciatica and several of fascial neuralgia, by employing Hudson's extract of stramonium;[3]

Dr. Begbie, also, has cured several cases of sciatica by the same means.[4]

The extract of stramonium of the London Pharmacopœia, was given at the City Dispensary in ten cases of neuralgia, with the view of ascertaining its value as a general remedy in these affections; in two cases, slight relief was obtained at first, but it was merely temporary; in a third (sciatica), the pains were completely removed, after having teased the patient about twelve months; in all the other cases, no alleviation of the symptoms was obtained.

Belladonna.—This substance has often been employed in the treatment of neuralgia. It may be given in doses of a quarter of a grain of the extract every two or three hours, until vertigo or other symptoms of its full action appear. The cases recorded, in which this medicine proved beneficial, are very numerous.[5] I have found it useful in a few instances.

In a case of severe enteralgia, the pains were removed after the second dose of this medicine, when other narcotics had been tried in vain; but it often aggravates the symptoms, causing a wretched sensation of stupor in addition to the pain, especially when it is prescribed without previously attending to the state of the bowels, or without first removing, or at least moderating, the irritation in which the neuralgia originated.

Conium. — This remedy was successfully employed by Dr. Fothergill in his cases of fascial neuralgia, and, for some time subsequently, was generally regarded as the chief means of relieving that affection; it has latterly grown into disuse, being superseded by more modern remedies; I am still disposed to regard it as a valuable medicine in neuralgia, having frequently prescribed it with much advantage.

Hyoscyamus has also been much recommended in this disease. It forms one of the ingredients of the pills of Méglin, which have

[1] Bardsley's Hospital Reports.
[2] Blumenbach's Med. Bibl. vol. ii.
[3] Medico Chirurg. Transactions, Lond. vol. vii.
[4] Medico Chirurg. Transactions, Edin.
[5] See Bailey. Obs. on the use of Belladonna.

obtained much celebrity among continental practitioners in cases of the kind. The following is the formula for their composition:—

R Extract: Hyoscyami.
Oxid Zinci.
Extract: Valerian: Sylvestris:—partes equales.

Méglin's patients generally began by taking a pill, containing three grains of this composition, night and morning, gradually increasing the dose, until vertigo, palpitation, or other symptoms of poisoning appeared, which generally happened after raising the dose to eight or ten pills morning and evening; but in one case twenty-four pills were exhibited at the same periods.

It may be doubted, however, whether the hyoscyamus is the chief ingredient of this composition; but it may be remarked that Méglin found the pills almost equally efficacious without the valerian.[1]

Hydrocyanic acid.—This medicine has been praised by some practitioners as useful in neuralgic affections, but I have never observed a single case of external neuralgia, where its administration was attended with benefit. Its usefulness in gastralgia is well known.

Sesquioxide of iron.—Since the publication of Mr. Hutchinson's work, the efficacy of this preparation in neuralgic affections, has been almost universally acknowledged. I have often witnessed the most happy results from its exhibition, even after various powerful medicines had been tried in vain. It is more particularly indicated where the patients complain of debility, and where the surface is pale and the pulse small; it should not be given, unless with great precaution, to plethoric patients; the dose which Mr. Hutchinson recommends, is from half a drachm to two drachms twice a-day;[2] but where it fails to remove the complaint in those doses, Dr. Elliotson advises that it should be increased gradually to one or two ounces. He has detailed several cases, where this practice was followed with complete success.[3]

Local applications.—Veratria.—This substance has latterly been much employed in neuralgia, chiefly in the form of ointment composed of half a drachm of the veratria to an ounce of lard. Speaking of this remedy from my own observation, I must observe, that although it is sometimes useful in slight cases, I have never succeeded in obtaining permanent relief from its employment, in any case of long standing.

The pain is often relieved in a most surprising manner by the first rubbing; and sometimes a considerable interval of ease ensues before the return of a paroxysm; but this interval grows less and less after each successive rubbing, until at length it is scarcely protracted beyond the continuance of the disagreeable pricking sensation which this application occasions; and the patient cannot be

[1] Méglin, Recher: et Observ: sur la névralgie Fasciale.
[2] Hutchinson, Cases of Neuralgia Spasmodica.
[3] Med. Chirurg. Transactions, vol. xiii.

persuaded to continue the use of a remedy which at first he had regarded with almost superstitious hopes.

The strychine, also, is useful in some cases, when employed externally as a palliative, in an ointment composed of one or two grains of the alkaloid to an ounce of lard; or dissolved in the same proportions in camphorated liniment. But, although this application may sometimes give relief in a neuralgic paroxysm, like the former preparation, its efficacy is impaired by use; and except in cases where the original cause of the disease had been removed, I have never found it completely subdue the pain; it has one advantage over the veratria, in not exciting the painful pricking sensations which that remedy produces.

Aconite and delphine ointments have been used in the cure of neuralgia, but I have not had an opportunity of witnessing their effects.[1] Other external remedies may often be resorted to with advantage, such as the emplast: belladon: emplast: opii, or bathing the affected part with lotions containing hydrocyanic acid, belladonna, opium, &c.

Counter-irritants.—Much benefit is sometimes derived by the application of rubefacients or blisters over the affected part, and many patients fly to these remedies habitually, when threatened with an attack. The application of croton oil, tartarised antimony, or the linimentum ammoniæ is sometimes beneficial. When blisters are employed, I have found it better to prescribe small ones and change them repeatedly, that to keep them open with irritating ointments.

Some practitioners speak of the moxa as a most valuable application in the cure of neuralgia; Pouteau, Larry, Barras, and many others, cured cases by this method. In my own practice, I have not been able to satisfy myself that it is of greater benefit than other external irritants.

The establishment of an issue, either over the affected organ, or at a distance from it, is sometimes useful; I think this remedy well worthy of trial in obstinate cases, which have resisted the ordinary modes of treatment. If there is any disposition in the pain to wander from its original seat, advantage may be taken of this tendency, by opening the issue over the part which the disease seems inclined to occupy, whenever this is practicable. By this treatment, the pain may sometimes be drawn from its former situation, to that occupied by the issue; where it is generally less severe, and more under the control of other remedies.

In a neuralgic affection of the face (observed by Siebold) which had been suspended during the continuance of a abscess in the shoulder, the symptoms ceased altogether upon the establishment of an issue over the seat of the abscess. Gunther, observing that the symptoms of facial neuralgia were relieved by the suppuration

[1] See Turnbull on Diseases of the Nerves and Eyes.

of a wound in the head, completely relieved the patient by subsequently opening an issue over the same spot.[1]

In Legge,[2] this plan of treatment has been very efficacious. After she had suffered for nearly twenty years from the severest form of facial neuralgia, the pain manifested a tendency to attack the arm, near the insertion of the deltoid; a blister applied over this spot, caused the pain to fly from the face and attack the blistered surface with great violence; and it continued to recur there, so long as the irritation was kept up; this circumstance suggested the propriety of opening an issue in the arm.

It is nearly two years since this operation was performed, and its results have been very satisfactory; the issue is frequently the seat of the neuralgic pains, but they are seldom of a severe character; and although the pain has several times returned to its old situation in the face, it has always been readily removed, either by exhibiting a few doses of purgative medicine, or when that has failed, by the application of stimulating ointment to the issue.

Acupuncturation.—I have never succeeded in curing neuralgia in this manner; the introduction of the needles seems generally to afford temporary relief, but in some instances it increases the suffering. In a case of sciatica where this treatment was attempted, the needles excited inflammation and all the punctures suppurated.

Endermic treatment.—This method of treating neuralgic affections is, I think, well worthy of trial in obstinate cases. The process consists in first applying a strong solution of ammonia, or a common blister, over the affected part, and after the cuticle has been removed, sprinkling the medicaments over the denuded surface. At each application of the remedy, care should be taken to remove the coagulable lymph which has been secreted, so as to allow the absorption of the drug. The only substances that I have employed in this manner, are strychnia and morphia, in doses of from a quarter to two thirds of a grain. In a few cases, the pains were subdued by this method in a remarkable manner, where the common remedies had been of no avail. My friend Dr. Watson has tried this plan of treatment extensively, in the Bath General Hospital, and has practised it successfully in several cases of neuralgia.[3]

A modification of this treatment has been lately recommended by some French physicians, which, in many respects, is preferable to the preceding one, as it can be employed without the necessity of previously removing the cuticle from the part where the medicine is to be applied.

This method consists in inoculating the seat of the pain with the medicament, which is inserted under the skin, in the same manner as in vaccination. Almost immediately afterwards, an areola begins to form around the puncture, and a white tubercle arises over the spot, resembling the sting of a nettle. The tubercle,

[1] Table Synop. [2] See Case xviii. [3] See Cases viii. and xix.

as well as the areola, are much better defined when the morphia is employed, than those which follow the introduction of the strychnia. Considerable itching and tingling accompany this local action, which generally continue about two or three hours, and then subside; about the same time, the skin resumes its natural appearance, with the exception of the slight wound left by the lancet.

I have inserted the morphine and the strychine beneath the cuticle, in at least twenty cases. The first patient[1] whom I treated by this method had been affected with neuralgia of the superior extremities for several weeks. In this man, the effects of the morphia were very remarkable, and the benefit immediate and permanent; but in every subsequent case this practice has completely failed in my hands.

Section of the nerve.—When every means of relief have been exhausted, the unfortunate patient, maddened by the incessant torture, urges the practitioner to attempt some operation which might eradicate his disorder; and, with this intention, a section of the affected nerve has often been made, but with very variable results. This attempt appears to have been first made by Maréchal, a celebrated French surgeon of the last century, who divided the infra-orbital nerve at the point where it emerges from the foramen. The first effects of this operation were highly encouraging, for the patient experienced complete relief, which, however, only continued for two or three days, when the disease again returned with all its former violence.

Some years afterwards, a similar operation was performed by Dr. Haighton, who, at that time, was not acquainted with any previous one. Upon this occasion, the patient was a female seventy-two years of age,[2] who had suffered for many years with the most excruciating facial neuralgia, chiefly affecting the ala nasi and the upper lip on the left side. The infra-orbitar nerve was divided; and in this case the operation was followed by relief. The success of this process excited hopes that a method of curing this formidable complaint had at length been discovered; but these hopes proved fallacious; for the operation generally failed, even in the hands of the ablest surgeons. It was next proposed to remove a portion of the nerve, so as to prevent the reunion of the divided extremities. This plan was successfully followed by Mr. Abernethy in a neuralgic affection of the radial nerve; but in most cases, even when the operation succeeded in arresting the pain for a period, which did not always happen, it was found that only a little longer respite was obtained than when the nerve was simply divided.

Upon the failure of Maréchal's operation, in the patient before alluded to, André pitying her sufferings, suggested the following

[1] Case xx.

[2] The patient was Dr. Haighton's mother. The operation was not finally successful, for the pains subsequently returned. See a letter from Dr. Currie, in S. Fothergill's Treatise on Dolor Faciei Nervorum Crucians.

proceeding, which he practised with success, in that and some other cases.

A plaster, into which several pieces of caustic potash were inserted, was applied over the supermaxillary nerve, where it emerges from the cranium. This application was continued or renewed until the nerve itself was laid bare, the suppuration being encouraged until the bone was exposed. A bistoury was then introduced into the wound, and made to cut across the bone, so as to ensure the division of the affected nerves.[1]

But this formidable process was soon found to be of very uncertain efficacy; for, as in the preceding operations, the pains generally re-appeared with the healing of the wound. This circumstance, together with the distortion which it occasions, must ever be a barrier to its frequent employment, especially in facial neuralgia.

Latterly, a modification of this method, combining the advantages of all the foregoing operations, has been practised. A section of the nerve having been made in the usual manner, and a portion of its substance cut away, each of the cut extremities is cauterised either with nitrate of silver, or by means of a small iron wire heated to whiteness, which is introduced into the wound so as to destroy the nerve, and also forced up its bony foramen. In some instances this plan appears to have been successful, where the simple section of the nerve had failed; but, like all other operations of this kind, no certain reliance can be placed on it. The practice of introducing escharotics into the bony canals is, however, a most dangerous one, for it cannot be performed without the risk of injuring the bone, so as to cause it to exfoliate; an accident more likely to increase the neuralgia than abate it.

From the above sketch, it will be seen that the chance of relief from an operation is doubtful. It would be an extremely valuable acquisition to our knowledge on this subject, if any rules could be ascertained for resorting to it with a greater certainty as to the result. The symptoms which seem to favour it are—the pain continuing for a considerable period in the same nerve, without manifesting a tendency to change its position; the absence of any obvious cause of a permanent nature, which would be likely to act upon other nerves after the operation, or to renew the pain in the same nerve when the immediate effects of the operation have passed away; such as organic affections of the brain or spinal marrow, tumours, exostoses, &c.

In every case, before the operation is resorted to, the patient should be informed that its effects are uncertain; but we should not be justified in refusing him this last hope of eradicating his complaint, when no circumstance seems to contra-indicate it; although, as Sir Astley Cooper justly observes, "It ought to be performed rather by the earnest desire of the patient, than by the recommendation of the surgeon."

[1] André, sur certains mouvemens convulsifs.

OF THE

PARTICULAR FORMS OF NEURALGIA.

Having gone through (it is feared very imperfectly) the general view of neuralgic affections, it now remains to examine each species separately, dwelling only upon those circumstances of their history, not comprehended in the former part of the work.

Neuralgia Facialis.—The merit of originality in describing this species of neuralgia is very generally assigned to Dr. Fothergill, whose account of a painful affection of the face was published in 1776.[1] This excellent communication was no doubt the means of introducing the disease to the knowledge of the practitioners of this country, and of some parts of the continent; for it was described by many writers of that period, as Dolor Faciei Fothergillii. But, in France, it had previously obtained much notice, in consequence of an admirable treatise by André, a surgeon of Versailles, who published in 1756, and gave this affection its present popular title of Tic Douloureux.[2] It seems also to have been observed by several other authors, nearly at the same time; some of whom wrote prior, and others subsequently, to the appearance of André's publication; although they were not successful in attracting much notice, until the history of the disease became afterwards the subject of more general enquiry.

This neuralgia was described with considerable minuteness by Thouret, the same year that Fothergill's paper appeared in this country.[3] Ludwig and Hoffmann also published well marked cases a few years previously, the former under the title of "De dolore superciliari acerbissimo;"[4] the latter heading his communication—"De Cephalalgia Rebelli."[5]

These various descriptions published nearly at the same period, by physicians in different parts of Europe, might at first sight seem to favour the opinion, that the disease originated about the middle of the last century. It will be observed, however, that some of these cases were communicated through the means of the medical journals, which then first began to appear, affording a facility of disseminating information which was previously unknown. There are, moreover, passages in the works of medical writers of every period, more or less applicable to this affection; although it must be con-

[1] Med. Observ. and Enquiries, vol. iii.
[2] Obs. Prat. sur les mal. de l'Ureth.
[3] Histoire de la Societé Royale de Médicine.
[4] Ephem. Nat. Curios. 1772.
[5] Med. Consult. vol. ii.

fessed, that the descriptions of the ancient physicians generally supposed to refer to it are not always very satisfactory.

Siebold, who wrote a treatise upon the disease, mentions that it had been observed by Degener, in 1724, who published some remarks upon it, under the following title:—"De dolore quodam perraro acerboque, maxillæ sinistræ partes occupante et per paroxysmos recurrente."[1] Degener also supposes that Bausch, the president and founder of the above society, died of the disease in 1665; and from the account of his symptoms, there can be little doubt that this opinion is correct. He had experienced for four years pungent pains of the left jaw, returning in paroxysms, and sometimes ceasing entirely. The pains were upon some occasions so violent, that the patient could neither speak nor eat without undergoing the greatest torture. Previously to his death, he was affected with hemiplegia of the left side.[2]

Sydenham also has given an excellent sketch of the disease in the following passage:—

"Sed neque ipsi dentes (quod vix credas) ab hujusce morbi insultu se possunt defendere; licet neque vel minima cavitas neque humoris alicujus defluxus, saltem qui percipi queat, dolori sive ansam præbuerit, sive vehiculum; qui nihilominus nec mitior est nec contractior aut expugnatu facilior."[3]

In 1829, a manuscript of the celebrated John Locke was presented to the College of Physicians by the late Lord King, in which is detailed the case of the Countess of Northumberland, ambassadress at Paris, in 1677, to whose embassy Locke appears to have been attached as physician. In this curious document, not only are the symptoms of facial neuralgia accurately given, but the true seat of the disease is distinctly referred to.

The description in Cœlius Aurelianus of the disease, called by him Raptus Caninus, has often been supposed applicable to facial neuralgia; but one very essential symptom is altogether unnoticed by this writer, namely, pain: and the violent convulsive motions of the muscles of the face, neck, and shoulders, of which he speaks, can hardly be said to represent the usual character of this neuralgia. The following is the passage alluded to:—

"In ista passione constitutos, sequitur conclusio, sive contractio repentino motu veniens ac recedens sine ulla corporis turbatione, in utriusque labii ultimo fine, sive oris angulo, ut etiam buccas adducat in posteriorem partem creberrime, tanquam ridentibus, nunc palpebras, vel supercilia ac nares, ut etiam colla atque humeros rapiat, et ita patientes faciat commoveri, tanquam onus humeris bajulantes transferendi ponderis causa."[4]

Aretæus has described a complaint which closely resembles the

[1] Act. Nat. Cur. vol. i.

[2] Siebold, Doloris faciei, morbi rarioris atque atrocis, observationibus illustrati adumbratio, 1795.

[3] Sydenham, Dissert. Epist.

[4] Cœlius Aurelianus, lib. 2, cap. 2.

facial neuralgia. Speaking of headache, he says, "Ejus formæ infinitæ sunt: nonnullis per cercuitus revertitur, ut iis qui quotidiana intermittente febricitant; nonnullis ab occasu solis usque in meridiem; et tunc ex toto remittitur; vel a meridie in vesperam, aut etiam ulterius usque in noctem permanet: sed non multum hæc durat circuitio; præterea, dolor modo est in toto capite, modo in dextra magis, modo sinistra, modo circa frontem aut sinciput; hæcque eodem die incertè atque erraticè fieri solent. Quidam dextra tantum parte dolent, quidam læva, qua tempus vel auris, vel supercilium unum, vel oculus ad medium, usque terminatur, vel quà nasus in æquas partes dividit; ultra quem terminum dolor non progreditur, dimidium tantum corporis occupans; * * * * * haud leve malum; quamvis intermittit, quamvis exiguum esse prima specie videtur; nam si acuté interdum impetum faciat, fæda atque atrocia detrimenta adfert; nervi distenduntur, facies obtorquetur; oculi vel contenti instar cornu rigidi sunt; vel huc atque illuc interius convelluntur, ac vertiginosè agitantur."[1]

Hippocrates has given no distinct history of this affection: he has however, been supposed to refer to it in the following description:—

Phenicis affectio ex oculo dextro talis quidam erat, plerumque velut fulgum elucere putabat. Quum autem non diu ipsum continuisset, dolor ad tempus dextrum instabat, et per totum caput ac collum.[2]

This complaint has received a great variety of names, of which the following are the principal—

Tic-Douloureux	André.
Trismus Dolorificus	Sauvages.
A painful affection of the Face	Fothergill.
Dolor Capitus Intermittens	Heberden.
Neuralgia Facialis	Chaussier.
Hemicrania Idiopathica	Darwin.
Neuralgia Spasmodica	Kerrison.

These different names (and others might be added) are a constant source of mistake and confusion. I have employed the term neuralgia facialis, in compliance with Chaussier's nosology; the addition of spasmodica is objectionable, because it refers either to an obscure theory of the disease, or to a symptom of comparatively rare occurrence, namely, the convulsive motion of the facial muscles during the paroxysms.

Some authors who adopt the term neuralgia in general, still retain that of tic douloureux when the disease appears in its most painful character; but this distinction is of no practical value, and might lead to erroneous impressions respecting the nature of the affection. "Painful affections (Bichat remarks) have been variously denominated, intermitting headache, hemicrania, tic douloureux, &c.

[1] Boerhaave's Aretæus. De Morb. Diuturn, lib. 1, cap. 2.

[2] Hippocrates, De Morb. Popular, lib. 5.

but they appear to be all the same disease, only varying in situation and degree."[1]

This species seems to be the most frequent, as well as the most severe of all the neuralgiæ. The course of the paroxysm is the same as that already mentioned in the general history of the disease, commencing generally with a sensation of heat or cold over the affected parts, with occasional violent strokes of darting pain, the latter gradually becoming more frequent, until the height of the attack.

This affection is principally seated in the branches of the fifth pair of nerves, sometimes occupying the ramification of one of its three principal divisions, without affecting the other; but more commonly, a few superficial filaments only are affected, which do not generally belong to the same nervous branch. It sometimes flies rapidly to different filaments, harassing each in its turn. It may occupy the whole of one side of the face, dividing it accurately, and even attack one half the tongue and one side of the fauces; but in general it is felt over a surface of less extent.

Nothing can exceed the severity of the pain in many of those unfortunate cases; any operation which seems to promise the smallest hope of relief is gladly submitted to. Blisters, moxas, and other external irritants, are voluntarily applied; and it is often with difficulty that the patient is persuaded from resorting to the most severe remedies, upon the mere chance of obtaining some alleviation to his sufferings.

The brain itself, or its membranes, are sometimes the seat of this affection. It has been supposed that hemicrania and periodical headache, where the pain does not possess the peculiar lancinating character of neuralgia, but is dull and obtuse, denote that it belongs to the parts within the cranium. It is certain, however, that this species of headache may originate in the disorders of the fifth pair of nerves, and that causes acting directly upon the cerebral mass, sometimes give rise to hemicrania, at others, to the ordinary symptoms of facial neuralgia. The character of the pain therefore is not a sufficient guide on this point.

Three varieties of facial neuralgia are enumerated by Chaussier, viz.—Frontal, Suborbital and Maxillary.

Neuralgia frontalis.—It is seated in the orbito-frontal branch of the fifth pair of cerebral nerves. The pain commences at the supra-orbital foramen, shoots over the superciliary ridge, and spreads through the upper eyelid to the forehead; it sometimes attacks the inner canthus of the eye, or the ball of the eye, creating in the latter a sensation as if it were bursting. In some instances the corresponding side of the face is also affected. During the paroxysm, the neighbouring arteries pulsate strongly; the veins become prominent, the tears flow abundantly, and sometimes temporary blindness ensues. This species has very commonly a periodical character.

[1] Bichat, op. cit.

M. Piorry has lately described a neuralgic affection, which he calls nèvralgie irienne ou ophthalmique, where the pains commence, as he supposes, in the nerves of the iris. It attacks persons who dwell in dark apartments; those who read or write much; artisans whose business requires them to fix their eyes continually upon minute objects, &c.

At the commencement of an attack, the symptoms are referred to the eye; the sight is suddenly obscured, or perverted; frequently a dark spot appears before the eye, surrounded by a luminous circle. After an interval of variable duration, generally not exceeding a few minutes, this symptom disappears, and is succeeded by stupor, vertigo, lancinating pains of the eye and temple, and a sensation of pressure over the eye, as if it were too full. About this stage of the attack, vomiting usually occurs, and the paroxysm begins to decline.[1]

Neuralgia Suborbitalis occupies the superior maxillary nerve. Commencing at the infra-orbital foramen, the pain spreads through the cheeks, the upper lip, the alæ nasi, and lower eyelid. Sometimes it attacks other branches of the nerve, darting through the teeth of the upper jaw, the maxillary sinus, the palate, and the root of the tongue, and occasionally extends over the whole of one side of the face. During the paroxysm, the facial muscles sometimes contract spasmodically, and the secretions of the salivary glands and nostrils are increased. The regular periodical type is less frequent in this species, than in frontal neuralgia, the paroxysms being often dependent on the movements of the jaw in speaking and eating.

Neuralgia Maxillaris is seated in the inferior maxillary nerve. In general, the pain begins at the mental foramen, and follows the ramifications of the nerve distributed over the chin and lip; or, passing through the mental foramen, it attacks the teeth of the lower jaw, the side of the tongue, the cheek, temple, and ear. In this species the paroxysms are nearly always irregular. It is less frequently observed than the other forms of facial neuralgia.

The influence of sex in predisposing to neuralgia facialis has been differently estimated by authors. Thouret found it most common among men, whilst, according to the experience of Fothergill, Heberden, Pujol, Meglin, and most other writers, it is more prevalent among women. A large proportion of the cases which have come under my own observation occurred in females.

When the pain is situated in a dental twig of the superior or inferior maxillary nerves, it is not uncommon to meet with patients who have had tooth after tooth extracted, until the gum of the affected side has been completely denuded. Sometimes, the pain is partially mitigated for a short time after the extraction, even

[1] Piorry, sur l'une des Affections désignées Migraine, ou Hemicranie. Pelletan. J. P. Coup-d-œil sur la Migraine.

when no caries existed; but it generally returns in a few hours, with its former or even with increased severity.

John Hunter says, "I have known cases of this kind, where all the teeth of the affected side of the jaw have been drawn out, and the pain has been retained in the jaw; in others, it has had a different effect; the pain has become more diffused, and has at last attacked the corresponding side of the tongue. In the first case, I have known it recommended to cut down on the lower jaw, and even to perforate and cauterise it, but all without effect."[1]

"The dentist," says Duval, "sends the patient to the physician, by whom he is again dismissed to consult the dentist, until at length the greater number of his teeth are sacrificed, and his days are ended in a most deplorable manner."

But on the other hand, in many cases, the symptoms have been found to originate in a carious tooth, even when decayed in a very slight degree, dependent probably upon the inflammation easily excited during that process.

When there is a general decay of the teeth, as is frequently observed in delicate persons, even in the prime of life, the facial nerves are very liable to become affected with neuralgic pains, which in these cases often attack both sides of the face at the same time; but although exceedingly teasing and distressing, the disease, under these circumstances, seldom acquires that intensity, by which it is too often characterised, when it occupies a surface of less extent.

Mr. Swan remarks, that "in old people, the teeth of one gum are sometimes entirely lost, so that those of the other are apt to press very much on the soft parts of the mouth, and produce slight ulceration, which sometimes causes very violent pains, exactly resembling Tic douloureux."

Sir Henry Halford has published some valuable observations, in which the disease was connected with "some preternatural growth of bone, or a deposition of bone, in a part of the animal economy where it is not usually found, in a sound and healthy condition of it, or with a diseased bone."[2]

In one case "the rending spasms, by which the disease is marked, were frequently preceded by an uneasiness in one particular tooth, which exhibited however no signs of unsoundness; on its being drawn, a large exostosis was observed at the root of the tooth, and the lady never suffered more than very slight attacks, and those very seldom afterwards."

Thouret imagined that this affection arose from pressure of the nerves, in consequence of disease of the bony canals through which they pass, but he adduces no facts to support this theory.

This affection has sometimes been found to depend upon a collection of fluid in the antrum Highmorianum, and in some fatal cases, disease has been detected within the cranium.

[1] John Hunter, op. cit.
[2] Sir H. Halford's Essays and Orations.

The late Dr. Pemberton suffered dreadfully from facial neuralgia. Upon a post-mortem examination there was discovered an unusual thickness of the os frontis, and a small deposit of bony matter in the falciform process of the dura mater.

Sir C. Scudamore has detailed the dissection of a patient who had been affected with facial neuralgia for several years, which at length terminated in apoplexy. In the falciform process of the dura mater, a small ossification was found, which excited inflammation, softening of the brain, and effusion.

In a severe case of the disease, situated in the second and third division of the fifth pair of nerves, which Mr. Tyrrell examined, he found "two fungoid tumours originating from the dura mater; one situated on the right side of the sella turcia, and connected with all the branches of the fifth pair of nerves, but particularly the second and third; the other was placed over the cuneiform process of the occipital bone, was the size of half a large hen's egg, and was connected with the other tumour by a process of the same fungoid matter."[1]

Dr. Bright has detailed the dissection of a case, where the pain was seated on the left side of the face, and was seldom completely removed, but became more severe in paroxysms.

"The membranes about the upper part of the brain offered nothing remarkable, but the quantity of serum, both external to the brain, and in the ventricles, was more considerable than is natural. The fifth ventricle was rendered very conspicuous; the brain was softer than in perfect health, and the medullary matter slightly mottled with a light purple cloud. The dura mater, immediately under the anterior part of the left middle lobe, was considerably but irregularly elevated by fungoid tumours, equal, collectively, to about the size of a pigeon's egg. There was a corresponding depression in the substance of the brain, which at this spot was slightly adherent and disorganized, but not completely softened; nor was the raised portion of the dura mater ulcerated or materially altered. The bone beneath the tumour was diseased, and in some parts offered no resistance to puncture; the morbid growth appeared to have extended from the sphenoidal sinuses; the mucous membrane lining all the nasal cavities on that side, were similarly affected, but to a less degree. There was a soft pedunculated polypus, of about the size and shape of a raisin, attached between the turbinated bones. The branches of the portio dura, so far as they were laid bare in the removal of the diseased parts, exhibited no morbid appearance."[2]

The principal value of these dissections appears to be, that they point out the occasional dependence of facial neuralgia, upon organic lesions of the brain or its membranes; but they cannot with

[1] Sir A. Cooper's Lectures on Surgery, vol. ii. Note, p. 407.
[2] Bright's Medical Reports, vol. ii.

any propriety be employed to establish a general theory, respecting the origin of the disease.

Treatment.—The rules of treatment suitable to neuralgia in general, will also be applicable in this particular species; but it will be necessary to make a few additional remarks, especially referable to facial neuralgia.

One of the first questions which the practitioner is generally called upon to decide, in the treatment of this disease, is, whether it is connected with the state of the teeth. This enquiry is often one of considerable difficulty, especially where no caries can be discovered by inspecting the teeth. In these cases, a careful examination into the history of the case becomes essential. Thus, the patient may recollect that previously to the appearance of his complaint, he had experienced pain in a particular tooth, or had observed it to be tender during mastication. The paroxysms may be found to commence or terminate with tooth-ache, or to be excited whenever a certain tooth is struck or otherwise irritated. Under either of these circumstances, the practitioner is fully justified in recommending the extraction of the tooth.

The practice of cauterising the alveolar processes, so as to occasion exfoliation, cannot be too strongly reprehended. This practice might readily excite the disease, but it is not easy to understand how it can cure it.

In some instances, an attempt has been made to relieve this neuralgia, by first extracting a molar tooth, and afterwards piercing its socket, so as to penetrate the antrum, and even injecting stimulating fluids into that cavity, without any rational grounds for such practice.

In a few cases, a collection of purulent matter has been discovered, upon the evacuation of which the disease was cured; but in others, the operation has been entirely useless. It need hardly be remarked, that it should never be attempted, unless when there are good grounds for believing that the antrum contains some irritating substance.

When the symptoms are connected with a general decay of the teeth, it may be often discovered that the principal source of the irritation proceeds from one or two teeth. Under these circumstances, the extraction of the offending tooth sometimes gives great relief. When this treatment fails, I have often succeeded in alleviating the pain, by touching the gums with lunar caustic, at the point which was the apparent source of the pains; at the same time, the general remedies for neuralgia should not be neglected.

In a case, mentioned by Mr. John Scott, where neuralgia of the face and throat was invariably excited by the act of swallowing, Mr. Pennington succeeded in effecting a cure by nourishing the patient for several weeks by means of enemata. The disturbance of the jaw and throat in eating was thus avoided, and the benefit derived was permanent.

But it may be doubted, whether the absolute quietness of the

affected organs, was here the only, or even the chief agent; for the patient became greatly emaciated, and the pulsations of the heart sunk considerably. It is easy to conceive, that these circumstances effect a change in the original cause of the complaint.

Otalgia.—This affection, popularly known as earache, has been well described by M. Itard, in his excellent work upon diseases of the ear.[1] The symptoms consist of acute pain, darting through the course of the chorda tympani, frequently attended with tinnitus aurium, and temporary deafness. In some cases, the pain sends lancinating strokes through the brain; in others, it spreads along the cheeks and temples, and is accompanied by redness of the eyes and a flow of tears; or it may alternate with neuralgia of other organs. It is a common affection in children when they are shedding their first set of teeth; it sometimes arises from enlargement and chronic inflammation of the tonsils, and from the causes common to neuralgic affections in general.

It is exceedingly important to distinguish otalgia from inflammation of the internal ear, for in the latter affection the brain or its membranes frequently become implicated, and fatal consequences might ensue, unless active treatment were speedily employed; yet earache is generally considered so slight a disorder, that it is scarcely thought deserving of medical interference.

Otalgia is distinguished from ottitis by the sudden accession of the pain; by its intermitting; by the absence of any discharge, redness, or swelling in the external meatus, and of febrile excitement; but this diagnosis should not be trusted implicitly, and in doubtful cases the propriety of bleeding and of other antiphlogistic measures should be considered.

It has been recommended in this affection, to bathe the parts with warm water, to apply flannels and poultices to them, and to inject some bland fluid into the external meatus; the practice of employing opiate injections is reprehensible; but M. Itard recommends that a mixture of diluted laudanum should be placed in a small phial, and that the vapour elicited by plunging the phial into hot water be directed into the meatus. A blister behind the ear sometimes gives relief. In other respects the treatment is the same as in other forms of neuralgia.

Neuralgia cervicalis.—This species is of comparatively rare occurrence; it is not included in Chaussier's synopsis.

M. Bousquillon has detailed one case which occurred after opening the external jugular vein; another, observed by M. Jolly, ensued after the application of leeches to the side of the neck.[2]

The case of Hawker[3] is an example of this neuralgia. Sharp pains accompanied by a thrilling sensation were experienced, commencing about the middle of the neck, and following the course of

[1] Itard, Traité des Maladies de l'Oreille.

[2] Dict. de Medecine.

[3] See Case IX.

the principal vessels; both sides of the neck were in this instance attacked at one time, the pain occupying precisely the same situation, and extending to the same point in each, but it was much more severe on the left side; several paroxysms occurred daily.

Neuralgia cubito digitalis, appears to have been first described with accuracy by Cotunnius, who has detailed five cases, all of which he cured by blisters, applied along the course of the affected nerve.

It is seated in the ulnar nerve; the pain generally begins at the upper part of the arm, and sometimes in the axilla; it passes along the inside of the arm and fore-arm, and follows the distribution of the nerve to its termination in the inside of the middle, the ring and little fingers. But the nerve is not usually affected throughout the whole of its course; in some cases the pain is confined to the humerus; in others it commences in the fore-arm, or it may occupy a digital branch alone, and when this happens, the sufferings are often most intolerable.

But in many cases the disease cannot be said to belong strictly to this nerve; for after following it accurately for a certain distance, it is often communicated to other nerves connected with the ulnar, by anastomosis, or even to parts of the arm where this nervous connection cannot be traced.

In some cases, the pain at the head of the humerus is observed to be fixed and constant; and from this point, the paroxysms of neuralgia seem to emanate, shooting down the arm in the manner described.

These attacks are generally periodical, and a paroxysm often comes on towards night. During the accessions, the sufferings are extreme; the arm feels stiff and benumbed, and the patient is obliged to support it with his other hand. In old cases the affected arm sometimes becomes wasted.

Neuralgia supra-scapularis.—The pain begins at the lower angle of the scapula, and extends along its posterior surface; it then ascends towards the dorsum scapulæ, and after winding round the external part of the arm, it reaches the anterior surface, and shooting down the outer side of the arm, terminates in the thumb and fore-finger. This species has been described by Martinet,[1] but its occurrence is extremely rare.

Neuralgia musculo cutanealis.—This species has also been described by Martinet. The pain commences at the shoulder, passes to the external and superior front of the humerus, and afterwards appears on the anterior surface of the arm and fore-arm, and disappears towards the lower extremity of the ulna.

Neuralgia intercostalis.—In this species the pain attacks one or more of the intercostal nerves, sometimes darting from their origin in the spine, to their termination over the breast and sternum; but much more frequently a portion of the nerve only is affected. It is

[1] Revue Medicale, 1824.

seldom observed in the upper part of the thorax, and occurs more frequently on the left side of the chest than on the right.

Neuralgia ileo-scrotalis.—It is seated in the branch of the first pair of lumbar nerves, which passes obliquely towards the spine of the ilium, accompanying the spermatic cord, and ramifying over the scrotum.

Chaussier met with two cases of this affection, in which the pain was extremely acute, returning regularly every day; and was accompanied by shrinking of the scrotum and retraction of the testicle.[1]

From the situation of this affection in the region of the kidney, and its effect upon the testicle, it might be mistaken for nephritis; but the absence of fever and of any morbid deposition in the urine, will generally be sufficient to distinguish it.

Neuralgia of the inferior extremities.—The ancient physicians appear to have included this form of neuralgia, under the general term of Ischias, to which they referred most affections of the lower extremities, where pain is a prominent symptom. Hippocrates, however, seems to allude to it in describing a species of ischias, marked by severe pains of the hip joint, and nates, afterwards descending through the whole limb, unattended with fever, which although troublesome and tedious, was not of a fatal character According to the obscure pathology of that remote period, he imagined it to be the consequence of morbid humours, stagnated in the veins of the affected extremity.[2]

The following passage from Aretæus is well known as being highly descriptive of the sufferings which attends this affection:—

"Initio verò nervi articulorum vincula, et quæcunque ex ossibus exorta sunt, et in ossibus inseruntur, dolere incipiunt, at istorum magnum est miraculum; non dolent quidem vel minimum, etiamsi quis secet, aut collidat; at si quis ab ipsis doleat, nihil aliud est eis ad dolorem citandam potentius, non ferramenta adstringentia, non vincula, non vulnerans gladius, non exurens ignis, nam si hæc assumantur, tanquam majorum dolorum remedia, quod si quis ipsa dolentia ossa preciderit sectionis dolor, ut exiguus a majore obscuratur sin autem iste prevaleat eos voluptas capit priorum malorum oblivionem afferens."[3]

But the same indistinct notions respecting the pathology of this affection, were held by this and all succeeding authors, until its connection with the nerves of the extremities was shown by Cotunnius, an Italian physician who wrote in the middle of the last century. This celebrated author described with great correctness, two distinct species of neuralgia seated in those parts; and adopting from Hippocrates the generic term of ischias, he named one ischias nervosa antica, and the other ischias nervosa postica, the

[1] Tab. Synop.

[2] Hippocrates. De Affectionibus.

[3] Aretæus. De Morb: Diurt: Lib. 2.

former corresponding to neuralgia femoro-pretibialis, the latter to the femoro-popliteal is of Chaussier's arrangement.[1]

Neuralgia femoro-poplitealis is seated in the great sciatic nerve. The pain commences over the sacrum, or about the great trochanter, shoots down the posterior part of the thigh to the knee, and passes over the front of the fibula to the outside of the foot.

At the commencement, the pain is often confined to the sacrum and nates, and does not begin to shoot down the limb until a subsequent period of the disease; sometimes the pain terminates at the knee, in others it begins at the foot, and proceeds upwards along the leg and thigh.

In the beginning of the attack, this affection has most commonly a continued or remittent type, which, as it advances, is gradually changed into the intermittent, a paroxysm mostly recurring towards night.

If it possess an intermitting character at the commencement, Cotunnius observed, that the same was retained throughout; he had never known an instance of the intermittent passing into the continued type.

During the paroxysms, the limb sometimes contracts spasmodically: its veins become prominent, and the valves appear like small knots, which are extremely painful, and often regarded by patients themselves as the source of their sufferings.

The paroxysms are excited by the motion of the limb; by pressure over the affected nerve, and even by the contact of a light substance; by warmth, the patient being often obliged to throw off the bed-clothes, and expose the limb to the cold air.

The causes which act especially in the production of this neuralgia, are—tumours within the pelvis, pressing on the lumbar or sciatic nerves; enlargement of the uterus; scybala in the rectum; hemorrhoids; curvature of the spine, &c.

In a patient who had long suffered severe pain in the course of the peroneal nerve, Sir B. Brodie found a large solid tumour attached to the left side of the lumbar vertebræ, and extending into the pelvis. "It was evident," Sir B. Brodie observes, "that this tumour must have pressed on the origin of the sciatic nerve, and thus it afforded a sufficient explanation of the pain which for so many years had been referred to some of its branches."[2]

A woman, aged fifty-eight, had suffered from an attack of this affection, which continued for several weeks without any mitigation. It was subsequently discovered that the rectum was much distended with fæces, requiring mechanical means for their removal. Afterwards, purgative medicines were administered, and the symptoms disappeared.[3]

A woman affected with a curvature of the spine, experienced severe pain in the great toe of the right foot, for about three or

[1] Cotunnius. De Ischiade Nervosa, 1770.
[2] Sir B. Brodie, l. c. [3] Piorry, l. c.

four hours after each meal, which always disappeared after a free evacuation of the bowels. It was subsequently found that the symptoms were occasioned by the pressure of the false ribs on the sigmoid flexure of the colon, so that the fæces in passing that point, occasioned compression of the lumbar plexus of nerves.[1]

The duration of sciatica varies from a few days to several years. In chronic cases, there is sometimes considerable difficulty in determining between this affection and disease of the hip joint; for the limb may become wasted, and apparently lengthened, in consequence of the relaxation of the muscles.

The following rules for distinguishing these affections are given by Sir B. Brodie.—"The patient is unable to support the weight of the body on the affected limb, and if he be placed on an even surface, in a horizontal position, and the hand of the surgeon be applied to the heel, so as to press the head of the femur against the concavity of the acetabulum, violent pain is the consequence; although this be done in so careful a manner, that not the smallest degree of motion is given to the hip joint.[2]

The same eminent surgeon has described a painful affection of the lower extremities, chiefly occurring in hysterical females, which seems to be a variety of this neuralgia.—"At first, there is pain referred to the hip or knee, or some other joint, without any evident tumefaction; the pain soon becomes very severe; and by degrees a puffy swelling takes place, in consequence of some degree of serous effusion into the cells of the cellular texture. The swelling is diffused, and in most instances trifling; but it varies in degree, and I have known, where the pain has been referred to the hip, the whole of the limb to be visibly enlarged, from the crista of the ilium to the knee. There is always exceeding tenderness; connected with which however, we may observe this remarkable circumstance, that gently touching or pinching the integuments in such a way that pressure cannot affect the deep-seated parts, will often be productive of much more pain, than the handling of the limb in a more rude and careless manner."[3]

The treatment recommended by Sir B. Brodie, is of the same description as that pursued in other hysterical affections.

Neuralgia Pretibialis vel Cruralis is seated in the crural nerve. The pain begins at the crural arch, passes along the anterior and internal part of the thigh, shoots down the front of the tibia, finally disappearing at the inner ankle, or in some of the cutaneous nerves of the foot.

It is much less common than the preceding species.

Neuralgia Plantaris is introduced in Chaussier's Synopsis. The pain shoots from the heel across the sole of the foot, and sometimes affects one or more of the toes; Chaussier had only met with

[1] Portal, Anatomie Médicale, vol. iv.
[2] Brodie, Path. and Surg. Obs. on the Joints.
[3] Brodie, l. c.

one case of this affection, where the pain, which was very acute, followed with great exactitude all the ramifications of the plantar nerve without observing any regular type. After continuing for several months it ceased suddenly, and was succeeded by facial neuralgia; subsequently the pain returned to the foot.[1]

Treatment of Neuralgia of the Inferior Extremities.—The modification of treatment adapted to this species, may be gathered from a consideration of its peculiar causes.

In chronic cases, a careful examination of the pelvic viscera should never be neglected, as it may lead to the detection of tumours, enlargement of the uterus, scybala accumulated in the rectum, &c., occasioning pressure of the pelvic and lumbar nerves; by reducing any unusual irritation of these organs, whether dependent upon organic disease, or merely deranged function, the sciatica may sometimes be relieved.

When there is much disturbance excited, in consequence of hemorrhoids, the sciatic pains may be frequently relieved by subduing the irritation arising from these tumours, and subsequently administering the common remedies of neuralgia.

Much benefit has sometimes been derived in protracted cases by the patient's resolutely persevering in the use of exercise, of which a very striking example is given by Pinel.[2] A gentleman who had long suffered from this affection, and had tried many remedies under the direction of that eminent physician, without the least advantage, was finally cured by resuming the fatigues incident to the profession of a soldier.

In a case communicated by Dr. Marcet, and published in the Medico-Chirurg. Transactions, the pains were removed by the patient's persisting in the daily use of exercise, with his body wrapped up in several folds of flannel. The use of flannel is, indeed, very important, both as a means of cure in chronic sciatica and in preventing a relapse.

The internal exhibition of turpentine has been much praised, especially by the continental physicians in cases of this kind; Martinet succeeded in removing several obstinate cases by this treatment, and M. Dufour cured six patients with the same remedy. Turpentine has also been employed advantageously in the form of an injection, or as an external application.

The exhibition of opiate enemata or suppositories, has also been found beneficial in this disease.

Neuralgiæ mammæ.—This affection was, I believe, first arranged among the neuralgiæ, by Dr. Good, but it does not appear to have been generally regarded by the profession, until Sir A. Cooper published his excellent description of the disease, which he denominated the Irritable Breast.[3]

[1] Table Synop.
[2] Pinel, l. c.
[3] Sir Astley Cooper on Diseases of the Breast.

The pain occupies the substance of the mammary gland, and is not generally accompanied by swelling, or indeed by any other external sign of disease; in old cases, however, the gland is sometimes observed to be larger than is natural. It chiefly attacks young persons, from puberty to the age of thirty; Sir A. Cooper never witnessed a single case prior to the former period. He says, "When the complaint affects the glandular structure of the breast, there is scarcely any perceptible swelling, but one or more of its lobes become exquisitely tender to the touch; and if it be handled, the pain sometimes continues for several hours. The uneasy sensation is not confined to the breast alone, but it extends to the shoulder and axilla, to the inner side of the elbow and to the fingers; it also affects that side of the body, even to the hip; the patients cannot sleep on that side, and the pain is so severe as to prevent even their resting on the diseased side; and the weight of the breast in bed in some instances occasions intolerable pain. Patients also state that heat and cold frequently succeed each other in the breast; and it would seem the pain resembles that in the tic-douloureux, darting like electricity through the neighbouring nerves. When the pain is most severe the stomach sympathises and vomiting is produced. The suffering is very much increased prior to menstruation, and is somewhat relieved during the period, and decreased after its cessation. There is no external mark of inflammation, as the skin remains undiscoloured."

"In some cases a small portion of one breast is affected; in others the whole, and, not unfrequently, both the breasts. This painful state continues for months and even for years with little intermission; but it has no malignant tendency, and an operation where there is no distinct tumour must be entirely out of contemplation."

One case of this affection seems to have been observed by Willis, although he evidently regarded it as having a malignant character, an opinion which is disproved by the age of the patient and the manner in which the disease terminated.

A young lady, sixteen years of age, received a severe contusion of the left breast, by falling from her horse upon a projecting stone; the bruise got well rapidly, and for a long time her health was tolerably good; but about three years after the accident she began to suffer severe and almost constant pain of the breast, which was slightly swollen; she could not endure it to be touched, or, indeed, the least noise or shaking in the bed-room. Various lotions and cataplasms failed to give her ease; sometimes the gland was attacked with spasms, and pains flying in every direction; and often a long train of hysterical symptoms ensued.

At first these paroxysms were transient, and only excited whenever the breast was irritated; but subsequently they became more frequent, and at length periodical, returning regularly twice a day at the same hour.

After passing six months in this miserable state, under the care

of different physicians, she removed to Bath, where her sufferings were somewhat mitigated by drinking the waters; she married shortly afterwards, and gradually recovered during her pregnancy.[1]

A mitigated form of this affection is by no means uncommon. Some women have great tenderness of the mamma, at each return of the catamenia; it frequently attends even slight cases of uterine derangement; but happily, the sufferings seldom amount to that high degree of intensity just referred to.

Treatment.—Sir A. Cooper recommends that the affected gland should be covered with a plaster, composed of equal parts of soap, cerate, and extract of belladonna, or a poultice with a solution of belladonna and bread. Oil silk should be worn upon the breast, or hair skin or some warm fur; by the perspiration thus excited the part is soothed and tranquillised.

Much benefit may be derived, at least in the milder form of this affection, by the application of leeches, or by cupping over the sacrum, or in the uterine region; I have often seen the symptoms disappear under this treatment when no application has been applied to the breast.

NEURALGIA OF INTERNAL ORGANS.

Every person who studies the phenomena of disease, without the intervention of theory, must admit that the internal organs are subject to complaints which are attended with severe pains, yet produce no change of structure in the part affected.

There is so close an affinity between internal affections of this description, and neuralgia of external organs, that it is surprising they were not universally perceived to be the same disease, modified by the situation and function of the affected parts. This is more remarkable, as Fothergill suggested their probable identity in his paper on facial neuralgia. "There are (he says) few physicians, I believe, who may not, in reviewing many cases which have occurred to them, of anomalous pains in different parts of the body, so as sometimes to counterfeit gouty, bilious, and other internal affections of the stomach and bowels, perceive some analogy between them and the complaint here pointed out."

This form of neuralgia seems to have been described by the older medical writers under the term rheumatismus scorbutus, as will appear from the following passage from Sydenham:—

"The pain seizes sometimes this part, sometimes that; but seldomer occasions swelling than the other kind (of rheumatism), neither is it accompanied with a fever, nor is it fixed so long, but is of a more wandering nature, and has irregular and disorderly

[1] Willis. Opera Omnia, 1682.

symptoms,—now it afflicts this or that member, by and by it only seizes the inward parts and occasions sickness, which goes off again when the pain returns to the outward parts, and so afflicts the patient by turns, and continues a long while like those diseases that are reckoned most chronical. It chiefly seizes women and men of a weakly nature."[1]

It would be difficult to name any circumstance in the history of those internal pains which does not bear a strong analogy to neuralgia: like it they are often represented as lancinating, cutting, &c., and aggravated by slight, and are increased by firm, pressure; they return in paroxysms, which are succeeded by an interval of ease; there is generally no symptom of febrile action, and, notwithstanding the severity of the pain, the general health is but little impaired, and even the functions of the affected organ are healthily performed during the intervals of the attacks.

A resemblance to neuralgia may also be observed, in many cases, in the sudden subsidence of acute pains of an internal part, which had occasionally tormented the patient during the greater part of his life; where the affected organ subsequently evinced no sign of disease; and where, even after death, no morbid appearance could be discovered in the viscus, so long the seat of most intolerable pain.

The nature of this affection becomes still more apparent in cases where external neuralgia alternates with visceral pains, or acute pain of an internal organ is suddenly replaced by external neuralgia.

The exciting causes of this nervous affection, are mostly the same as those enumerated in the general history of the disease; but it seems to be in an especial manner under the influence of mental causes, being often excited by anxiety, depression of spirits, fear, &c. It sometimes arises from irritation acting upon the external surface of the body, as mechanical injury of a nervous twig, &c.

Neuralgia of the organs of respiration and circulation.—*Angina pectoris.*—Since the publication of Heberden's paper on this subject, in 1768,[2] no disease has more engaged the interest of medical practitioners. The admirable history of its symptoms, given by that eminent physician, deserves all the praise of originality, having been written entirely from his own observation. The disease had, however, been previously noticed by some other authors, and is distinctly alluded to by Sauvages, who placed it in his nosology under the title of cardiogmus cordis sinistri.[3]

The writers on this subject, subsequently to the appearance of Heberden's communication, have been very numerous, many of whom have given a name to this disease according to their fancy, generally suggested by its most remarkable symptom, viz. painful constriction of the chest.

Several pathological theories respecting this affection, have also

[1] Pechey's Sydenham. p. 204.
[2] Transactions of the College of Physicians, vol. ii.
[3] Cyclo. of Pract. Med. Art. Angina Pectoris by Dr. Forbes.

been advanced at different times, which further experience has tended to disprove, and the opinion now prevails very commonly, that angina pectoris is a form of neuralgia, not necessarily connected with structural disease of the heart or large vessels, although very frequently accompanied by lesions of these organs.

Like other kinds of neuralgia, this disease attacks in paroxysms, that are for the most part irregular; at first the intermissions are of long duration, and sometimes even several years intervene between the first attack and the subsequent one; but they afterwards become more frequent, being excited by any moderate exertion, such as walking against the wind, or over elevated ground; by talking; by mental excitation, especially sudden surprise or alarm; and in some cases, the patient is attacked when he remains calm and quiet, or even during sleep; the attacks are also more readily excited after meals.

The paroxysms commence with a feeling of constriction of the chest, accompanied by acute pain over the lower portion of the sternum, extending to the left side of the thorax, and the inside of the left arm so far as the elbow. In some cases, the pain runs along the course of the brachial nerves to the fingers, and even over the whole of the left side of the chest; sometimes two or three successive strokes of lancinating pain, appear to plunge through the substance of the heart.

The respiration is seldom much impeded; but deep involuntary sighing generally accompanies the attacks; the countenance grows pale, the skin becomes chilled, and the patient has a dreadful sensation, as of approaching dissolution; the pulse generally becomes small and feeble; in some cases, however, it acquires strength during the paroxysms; sometimes its velocity is increased, at other times it becomes slower than natural. The attacks usually terminate with an eructation of gas from the stomach.

The stethoscope does not always indicate any unusual action of the heart during the accessions. In one instance, I have observed that it always beats violently against the ribs when an attack occurs, whilst at the same time the pulse at the wrist becomes sensibly smaller.

With regard to the nerves which are the seat of angina pectoris, there is still considerable uncertainty; it has been assigned by different pathologists to the phrenic, pneumo-gastric, sympathetic, and intercostal nerves. In most cases, branches from the brachial and cervical plexuses, and sometimes more distant nerves are also affected, either sympathetically, or from their anastomosis with the nerves which are the principal seat of the complaint.[1]

This disease is much more frequent in men than in women. Of eighty-eight cases collected by Dr. Forbes, no fewer than eighty occurred in men. It seems to be more prevalent in the later periods

[1] Laennec de l'Auscult: Médiate, vol. ii; Bouillaud, Traité Clinique des Mal. du Cœur.

of life, and seldom attacks persons under the age of fifty. Patients of a gouty habit, and those who indulge in indolence and luxury, are said to be particularly liable to its attacks. I have seen some cases, which were apparently occasioned by long continued and active exertion.

The results derived from morbid anatomy respecting the cause of this affection are far from being uniform. In several cases, the coronary arteries have been found ossified, and this lesion was formerly supposed to constitute the true pathology of the disease, an opinion which is still entertained by some physicians. In many instances, however, these vessels have been found perfectly free from disease. Laennec examined the bodies of several patients who died of angina, but did not find the coronary arteries ossified in a single case; and, on the contrary, these vessels have been often observed in a diseased state, where no symptoms of agina pectoris had been noticed.

In other fatal cases the heart has been found dilated or hypertrophied, or with its valves ossified; in others, it has been discovered paler than natural, or softened, or embedded in an unnatural quantity of fatty matter.

But in some instances the heart and its appendages have retained their normal appearance. Sometimes, the only morbid change discovered has been enlargement of the liver, or spleen, or tubercles in the lungs; whilst in others, no alteration of structure could be detected in any part of the body.

From these considerations, it may be doubted whether angina pectoris is necessarily allied to organic changes of the heart or primitive vessels; or indeed, whether there is a certain definable lesion of any organ which invariably gives rise to it, or which is required for its development. Nor is it by any means well ascertained, that the alterations in the structure of the heart observed in many cases, are not the consequence of its continued functional derangement; or at least, that the latter has not occasioned the extension of mischief originally of small extent.

In a case which I have had an opportunity of closely watching from its commencement, about three years ago, the rhythm of the heart could not be distinguished during the first attacks, even in the precordial region, although it can now be heard distinctly over the whole anterior portion of the chest.

If the principles which seem to determine the production of neuralgic affections generally, be applied to the explanation of the symptoms of angina pectoris, they will lead to the following conclusions:—That many cases are to be ascribed to mechanical irritation of the cardiac nerves, by distension of the great vessels, when exertion is made, or when the circulation is otherwise accelerated; whilst in others, the changes in the structure of the heart, are to be regarded as the means of determining the irritation excited by some other cause to that organ, rather than as the origin of the disease.

In the case of M. Piorry, already mentioned, where the patient

complained of neuralgic pains darting through the heart, it was discovered that the primary cause of the symptoms was a carious tooth. The heart was indeed largely hypertrophied, but the pains referred to it entirely ceased as soon as the tooth was extracted.

The prognosis in angina pectoris must generally be unfavourable, especially when the patient is advanced in life, and when there is extensive disease of the heart or large vessels. In its most aggravated form, sudden death is to be apprehended. In slight cases, however, a recovery may be fairly anticipated.

In the treatment of this affection, the necessity of avoiding every circumstance which has a tendency to excite the circulation should be impressed upon the patient. His mind should be kept uniformly tranquil, and whenever retirement from the active duties of life is practicable, the importance of this step should be insisted on. Exercise of the most moderate description should alone be employed; and, in severe cases, should be restricted to a quiet drive.

The diet should be light and unstimulating; and care should be taken not to distend the stomach with food so as to occasion pressure of the thoracic viscera. In general, mild purgatives are required to keep the bowels freely open.

The greater number of practitioners agree in condemning the employment of venesection in this complaint. In some cases, however, where the patients were plethoric, this practice seems to have had the effect of diminishing the intensity of the attacks, and protracting the length of the intermissions.

Laennec speaks with much praise of the application of the magnet to the chest, as a remedy for angina pectoris. Issues, either in the side or the extremities, may be found advantageous in some cases. Dr. Davies recommends the application of a belladonna plaster to the chest, from which he has observed much benefit; especially when the disease is not complicated with organic affections of the heart.[1] All the other remedies recommended in the treatment of neuralgia, may also be tried in this complaint.

During the paroxysm, the patient should be placed in a reclining posture; and a draught containing ammonia, camphor, æther, opium, &c. administered.

Neuralgia of the arteries.—Pains, more or less acute, are sometimes observed to follow the course of the arteries, which Laennec conceives to be seated in the nerves proceeding from the ganglionic system to these vessels. These pains, he observes, are either intermittent or continued, but are less severe than similar affections of the cerebro-spinal system.

But the arteries of the limbs are supplied by the spinal nerves, and the severe pain which is sometimes observed along their course, indicates that it is derived from a source more sensitive than the sympathetic nerve appears to be. This subject, however, deserves

[1] Dr. Davies on Diseases of the Lungs and Heart.

further investigation. These pains may sometimes be relieved by the application of a blister in the course of the affected artery."[1]

Neuralgia of the organs of digestion.—Gastralgia.—This affection is marked by paroxysms of pain commonly described as lancinating, tearing, or burning, situated in the region of the stomach, and frequently extending to the thoracic parietes and to the back. It presents every degree of intensity, being sometimes merely a sensation of slight uneasiness, or of constriction in the epigastrium, whilst, at others, the sufferings are of the most acute description. The duration of the attacks is also extremely various. In general, they do not continue longer than a few minutes, but are occasionally prolonged to several hours; they often terminate with a copious secretion of gas, either alone or mixed with a quantity of limpid fluid, which rises spontaneously to the mouth, being sometimes insipid, but at others having an acrid taste. Notwithstanding the disturbance in the principal organ of digestion, that process is seldom materially disturbed; the tongue generally remains clean, and the appetite good, and, in some cases, it is voracious;—the bowels are mostly constipated. The pain is often relieved by food; —there is usually no thirst, or excitement of the pulse, or any other febrile symptom; and although the disease may have existed for many years, the patient often continues to bear the aspect of health.

The length of the intermission or remission varies in different cases; two or more attacks sometimes recur daily at regular periods, in other cases the intervals are much longer and are irregular.

Gastralgia may be mistaken for chronic gastritis. By contrasting with the foregoing description the following sketch of the latter affection the diagnosis will be apparent, at least in common cases.

In chronic gastritis the pain is obtuse and confined to the epigastrium; it is increased by pressure, and aggravated by ingesta; it has no regular intermission; the tongue is commonly parched, and red at its tip and edges, with incrustation on its centre; the breath is fetid; the mouth foul; there is much thirst, and a continual desire for cold drinks. The appetite is bad, and the sight of food disgusting, and when swallowed it is almost instantly rejected. If it remain in the stomach, digestion is imperfectly performed, and is attended with acid or fetid eructations and febrile excitement.

The causes which act particularly in the excitement of gastralgia are—long abstinence, especially when the mind is anxious; an insufficient diet, with regard either to the quantity or quality of the aliment; uterine disturbance; irregular action of the heart, causing irritation of the pneumo-gastric nerves; pressure against the epigastrium, as required in the employment of certain artisans, such as shoemakers, weavers, &c.

[1] See Laennec. De l'Auscultation Médiate. Copland's Dict. of Pract. Med. art. Arteries.

Enteralgia.—In most points of its history this affection resembles the preceding species. It occurs in a great variety of forms, and is, under one or other of them, very commonly met with.

Sometimes there is merely an unpleasant sensation of heat or weight, or trembling in the abdominal region; often recurring at regular periods, or appearing whenever the mind of the patient is unusually depressed.

Sometimes it has an acute character, the patient being seized suddenly with violent pains of the abdomen, which twist round the umbilicus, and return in frequent paroxysms; but the attack seldom continues beyond a few hours. The common colic is an example of this form of the disorder.

In other cases the pains are continued for several days, closely imitating the symptoms of peritoneal inflammation, but having in general well marked exacerbations; they are often aggravated by pressure, and accompanied by considerable excitement of the pulse and symptoms of general disturbance.

This form is commonly observed in hysterical young women, about the periods of the catamenia, or in connection with uterine disorders; but it often occurs from other causes, and well marked cases are sometimes observed in young men, even when of robust make.

The diagnostic signs of this affection have already been examined; but it may here be repeated, that in doubtful cases, the only satisfactory mode of ascertaining its real nature, is to watch the effects of different plans of treatment.

The intestines are also subject to a chronic kind of enteralgia, which may be prolonged to many years, without effecting any visible change in the health of the patient. The pain generally occupies the same region of the abdomen, recurring at intervals of longer or shorter duration; the paroxysms are either intermittent, remittent, or periodical.

Treatment of Gastralgia and Enteralgia.—The importance of strict attention to diet in these disorders must be evident: the pains are often excited in individual cases by certain articles of food, not generally of an irritating character. Whenever this idiosyncracy prevails, it should be strictly attended to, and the patient should carefully avoid partaking of the substance which he has learned from experience is apt to excite the return of his disorder. In other respects, he may be allowed in moderation any plain food.

A removal from accustomed scenes and employments is often productive of great benefit; indeed the effect of traveling on this complaint is sometimes very remarkable. I am acquainted with a gentleman who resides at some distance in the country, who is subject to a troublesome sensation in the region of the cœcum; the attacks continue about three or four hours daily. Upon several occasions he traveled to town for the purpose of seeking medical

assistance, but before he arrived at the end of his journey the symptoms generally disappeared.

A curious example of this kind is reported by Barras, in the case of a guard of the malle-poste, who was affected with chronic enteralgia. His complaint never troubled him on the days that he traveled, but invariably recurred on his resting days.[1]

I have found no medicine of greater efficacy in warding off the paroxysms of enteralgia and gastralgia (particularly the latter) than the extract of nux vomica. The bismuth is often beneficial, either alone or combined with rhubarb, as recommended by Dr. Abercrombie, who also speaks favourably of a combination of sulphate of iron, aloes, and aromatic powder.

Some cases require no further treatment than the regular administration of purgatives, so as to remove the constipation incidental to this complaint. Tonic and alkaline medicines, or a combination of a bitter infusion with mineral acid, are sometimes useful.

Dr. Elliotson has published a large number of cases where gastric pains were successfully treated with hydrocyanic acid, which is now generally regarded as one of the best remedies in this disorder; its exhibition is sometimes followed by an immediate cessation of the pain; but it seems to be far more valuable where the pain is seated in the stomach itself, than in enteralgia.

Opium, belladonna, conium, oil of cajeput, and other remedies, already mentioned when considering the general treatment of neuralgic affections, may also be tried with advantage.

Sometimes a cure is effected by means which could not a priori be supposed to act beneficially in this disease. I have known, for instance, two cases where chronic enteralgia was relieved by the habitual use of cider.

Hepatalgia.—The symptoms of this affection are, pain in the right hypochondrium, extending to the back and thorax, generally recurring in paroxysms, which in some instances are attended by a copious secretion of bile. The bowels are generally constipated; the alvine evacuations and the urine retain their natural appearance.

In some cases it might be difficult to prove whether these pains are seated in the liver, or merely in the abdominal parietes; in others, the evidence of hepatic derangement cannot be disputed.

Andral examined several patients who died with the skin coloured with jaundice, although the liver was found in a healthy condition, and the biliary ducts completely pervious. These cases (he supposes) are nothing more than neuralgia of the hepatic plexus.[2]

Hoffmann had a patient who was subject to paroxysms of acute pain in the right hypochondrium, which recurred daily, each attack being invariably followed by icterus; but the latter was of a

[1] Barras. Traité sur les Gastralgies et les Enteralgies.
[2] Andral, Clinique Médicale, vol. iv.

very evanescent character, and after a few hours the skin resumed its natural appearance. The pains were extremely acute, but were not accompanied by cough or dyspnœa, and were followed by intervals of perfect ease.

Subsequently this patient was attacked with excruciating pains of the teeth, ("dentium tormenta,") which regularly alternated with the hepatic pains, so that when one came on the other disappeared.[1]

The exciting causes of hepatalgia have not been hitherto much observed, but they are most probably the same as those of other neuralgic affections.

The functions of the liver are readily disturbed, in consequence of mental agitation or of cerebral disorder; and some remarkable cases are recorded, where jaundice was suddenly produced from fear, or from an injury of the brain.[2]

Andral had a patient who, for a short time before his death, suffered acute pain in the region of the liver, which was accompanied by icterus, and the latter affection was present when he died. No trace of calculus could be detected either in the biliary ducts or the gall-bladder; and the only morbid appearance was dilatation of the cavities of the heart.[3]

A lady, aged forty-five, had for several years been subject to hemorrhoids, giving rise to pains in the course of the sciatic nerve. Some time afterwards she began to experience acute pain in the hepatic region, which never left her entirely, but became greatly aggravated towards night; no enlargement of the liver was indicated by percussion. After a trial of bleeding, baths, antispasmodics, &c., without benefit, the quinine was administered in doses of twelve grains, which had the effect of first retarding the accessions of pain in the right hypochondrium, and finally preventing their return.[4]

Hepatalgia may be distinguished from hepatitis by the absence of fever; by its intermitting character; and especially by the disposition of the pain to change suddenly from the liver to other parts of the body.

It is more difficult to distinguish this affection from the irritation occasioned by the passing of a gall stone. It is quite possible for the latter circumstance to occur without its being observed by the patient, and without causing jaundice or altering the colour of the dejections; this has happened repeatedly where the subsequent history has put the nature of the case beyond doubt. Hepatalgia may, however, be suspected when the pains recur at regular periods, and the icterus is sudden and transient. An enquiry respecting the duration of the symptoms, and whether the patient has suffered

[1] Hoffmann. Consult. Med.

[2] See Morgagni. De causis et sedibus Morborum, vol. iii. epist. xxxvii.

[3] Andral. Clin. Méd. vol. iv.

[4] Piorry Clin. Méd.

from other neuralgic affections, might also assist the practitioner in his diagnosis, which in all fresh cases must be attended with much difficulty. The treatment required in this affection is similar to that which is employed in enteralgia.

Neuralgia of the Urinary and Genital Organs. Nephralgia.—This term is generally employed to denote the symptoms occasioned by the irritation of a renal calculus; there can, however, be no doubt that the kidneys are sometimes the seat of pains which are totally unconnected either with calculus or inflammation, but possessing a purely nervous origin.

Sydenham, in his history of hysterical affections, has detailed the symptoms of this disorder with his accustomed precision. "Quandoque hoc malum in alterutrum ex renibus incursans, atrocissimo, quem illiic parit, dolore paroxysmum nephriticum omnino mentitur, idque non solum doloris genere locoque, quo sævit, sed et adscitis vomitionibus immanioribus, tum etiam nonnunquam ex eo, quod dolor per ureterum ductus propagetur ita, ut ægré admodum diognosci queat, utrum hæc symptomata ab incluso calculo, an vero ab effectu aliquo hysterico enascuntur."

A remarkable instance of this affection is given by Dr. M'Culloch. His patient had suffered from neuralgia in various parts of the body, which at length attacked the kidneys, and was accompanied by diabetes mellitus. "Respecting this part of the disease (he adds) that it was rigidly paroxysmal, or that the morbid secretion of sugar commenced with the fit, and entirely disappeared in the interval."

The following case was considered as an example of this affection, from the severity of the pain in the neighbourhood of the kidneys, and the absence of any other evidence of disease.

Michael Loftus (painter and glazier), aged forty-two, suffered for several months from acute pains over the left kidney, occasionally extending to the umbilicus, and sometimes attacking the same situations on the other side of the body, described as thrilling and shooting: it never left him entirely, but was greatly aggravated in irregular paroxysms, especially after walking much; the pulse and tongue were natural and the general health good. There had been no retraction of the testicle, nor could any morbid appearance be detected in the urine. He was cupped, and blistered repeatedly over the loins, and various other remedies employed, but no benefit ensued. It was, therefore, determined to try the endermic method. A blister having been applied over the seat of the pain, on the left side, about half a grain of strychnine was sprinkled over the abraded surface; the pain was much easier on the next morning, when the same quantity of alkaloid was applied; and this was repeated until the blistered surface had so far healed as to prevent the application being continued longer with advantage. This happened upon the fifth day, when the pain entirely disappeared from the left side, but was still felt on the right, where it was even more severe than formerly; the same treatment was therefore employed

there, and with the same result. He continued free from pain for several weeks afterwards, when I lost sight of him.

Nephralgia may be distinguished from nephritis by the absence of fever—by the paroxysmal character of the pain—and by there being no retraction of the testicle.

Between this affection and the pains arising in consequence of renal calculus, the diagnosis is more difficult. All the symptoms of nephralgia generally accompany the latter; but in addition, there may be others which denote its peculiar nature, particularly the morbid depositions in the urine, which, indeed, afford the best grounds of diagnosis.

The same general treatment is applicable in this affection as in the preceding neuralgia.

Neuralgia of the neck of the bladder and urethra.[1]—In this affection the pains shoot through these parts, sometimes extending over the loins and sacrum, and are attended by a sensation of heat and itching in the urethra, especially at the extremity of the penis; the paroxysms excite the urgent necessity to make water, although there is often great difficulty in passing it. It is often thrown out in jets, or the stream is suddenly stopt.

The attacks are frequently periodical, either recurring daily at a certain hour (generally night or morning), or every second or third day. During the intermissions, the patient is free from pain, and the urine is passed without difficulty. In old cases the attacks are more frequent, and are generally irregular.

It often occurs without any appreciable disease, either of the bladder or of the neighbouring organs; and indeed, without any evident cause. It may be excited by venereal indulgences, by gonorrhœa, by irritating injections, by the frequent use of catheters, by constipation, or by an acrid state of the urine. It may also arise from organic disease of the urinary apparatus, from calculus in the kidney, or bladder, catarrh of the bladder, strictures of the urethra, enlargement of the prostrate gland, or from affections of the rectum or uterus.

By far the most important consideration connected with this affection, is to decide whether the symptoms are dependent upon the presence of a stone in the bladder. This diagnosis is often one of great difficulty, and the operation of lithotomy has sometimes been performed unnecessarily, in consequence of an erroneous opinion as to the nature of the case.

The surgeon should be apprised, that the severe pain and the sudden stopping of the urine, commonly supposed to be the immediate consequence of the contact of a stone with the lining membrane of the bladder, is often a secondary affection; and may arise from causes exterior to that viscus. But the presence of a calculus may be suspected, when the accessions are irregular, and the

[1] See Abernethy on Diseases of the Urethra. British and Foreign Med. Review, 1837, page 231.

intermissions incomplete; when the pains are excited by the patient standing erect, and relieved when he assumes a reclining position; when the urine will not flow without a change of posture, and then passes in a full stream; but the only satisfactory method of ascertaining the real nature of the case is, to explore the bladder by means of the sound.

Treatment.—M. Civiale cured many cases of this neuralgia, by the repeated introduction of bougies into the bladder; in some instances, the pains were checked at once, by passing a sound, for the purpose of ascertaining the existence of calculus; but M. Civiale recommends the employment of the soft bougie, of moderate size, at the commencement, which should be kept in the bladder about ten minutes and then withdrawn. This operation is to be repeated every day, gradually using a bougie of larger dimensions, until one of the full size can be introduced without pain or difficulty.

When this treatment has been tried without benefit, M. Civiale advises the injecting of water into the bladder, the temperature of which should be gradually reduced. Blisters or irritating ointments applied over the pelvis or perineum, sometimes prove beneficial. When the cause can be ascertained, the treatment must be varied according to the affection with which the neuralgia is associated.

When there is a superabundance of acid in the urine, alkaline diuretics should be tried. Constipation should be removed by a course of purgative medicine; the pains may sometimes be palliated by opiate injections or suppositories, fomentations, warm bathing, &c.; a trial may also be made of the other remedies generally found beneficial in neuralgic affections.

Neuralgia of the testis.—Sir Astley Cooper has published an excellent history of this affection, as it appears in its most aggravated form, to which he has given the name of The irritable testis.

The following is his description of its symptoms:—

"The patient has an unnatural sensibility in part of the testicle or epididymis; it is extremely tender to the touch, painful on exercise, and unusually sensitive at all times.

"Its sensibility becomes occasionally so much increased, that the slightest touch produces the most exquisite sufferings; the pain is felt in the back and groin. The motion of the testis, and the slight pressure it receives from the clothes in walking, produce so great a degree of pain as almost to forbid exercise; and the patient is obliged to seek relief by continually reposing upon a sofa, or by remaining in bed. The testicle is but little swollen; it is not equally tender in every part, but there is a point in which the morbid sensibility particularly resides; the epididymis and spermatic cord also suffer from similar sensibility, and if the part be not supported, the pain is scarcely tolerable; and when the patient is in the recumbent posture, he is obliged to place himself on the opposite side to the disease, or he does not rest; he has pain in the groin and thigh upon the same side, and the testicle appears fuller

and more loaded than the other; motion in most cases, produces not only pain at the time, but much increased inconvenience for some hours afterwards; the pressure of the hand in examining it, occasions great uneasiness, and leaves the testis additionally sensitive. The stomach is rendered extremely irritable, even to the degree of occasioning vomiting."

The distress which attends this affection, is in some cases so intolerable, that the patient urges the surgeon to attempt a cure by means of an operation. Sir Astley Cooper has removed the testicle in three cases, at the earnest entreaty of the patient; and in all of them he was completely successful in eradicating the disease.[1]

Barras was at one time of his life affected with neuralgia of the spermatic cord just below the inguinal ring, which, after having for four years resisted every remedy, was finally cured by the application of moxas over the seat of the disorder.[2]

I have never seen this neuralgia in the very severe form alluded to in the above description. In Cummin,[3] who was subject to neuralgic pains in various parts of the body, the testicle was once attacked for a few minutes; he described the suffering as beyond comparison greater than that which the complaint had occasioned in the other organs.

But cases where the pain is of a less intense description, and more under the control of remedies, are frequently met with, occurring in some patients upon any slight derangement of the bowels, or of the general health.

Treatment.—Sir Astley Cooper recommends the exhibition of calomel and opium, until the salivary glands are slightly affected, giving at the same time, the decoct. sarsap. comp. He also recommends a blister to the groin, which is to be kept discharging by means of stimulating ointments; evaporating lotions may be applied also to the testicle.

The operation of removing the testicle does not afford the sure means of extirpating the disease; and although in the cases of Sir A. Cooper, this object was obtained, it cannot always be relied upon. Professor Russel has detailed three cases of this disease, which occurred in Edinburgh. In the first, the testicle was removed, with the effect of giving immediate and permanent relief to the patient; in the second case, the operation was also attempted, but scarcely any mitigation of the suffering ensued; in the third, the symptom disappeared spontaneously, after all treatment had been hopelessly abandoned.[4]

Judging, therefore, not only from these cases, but also from the habitudes of neuralgic affections in general, we may conclude, that the operation should not be hastily performed, nor until the disease has continued so long as to render a cure nearly hopeless by other

[1] Sir Astley Cooper on Diseases of the Testis.
[2] Barras, l. c. [3] See Case vi.
[4] Russel on the Testicle.

means; and never without making the patient fully understand the uncertainty of the result.

Hysteralgia, Neuralgia of the uterus.—The irritable uterus.—The late Dr. Gooch has given an admirable description of an affection, styled by him, the irritable uterus, which appears to be an aggravated form of Hysteralgia.—"A patient who is suffering from the irritable uterus, complains of pain in the lowest part of the abdomen, along the brim of the pelvis, and often also in the loins. The pain is worse when she is up and taking exercise, and less when she is at rest in the horizontal posture; in this respect it resembles that of prolapsus uteri, but there is this difference, that in the latter, if the patient lies down, she soon becomes quite easy; but in the complaint of which I am speaking, the recumbent posture, although it diminishes, does not remove the pain. It is always present in some degree; and severe paroxysms often occur, although the patient has been recumbent for a long time. If the uterus is examined, it is found to be exquisitely tender; the finger can be introduced into the vagina, and pressed against its sides without causing uneasiness, but as soon as it reaches, and is pressed against the uterus, it gives exquisite pain."[1]

Besides this extreme degree of suffering, there appears to be another form of the disease of very common occurrence, in which the symptoms immediately referred to the uterus, are of a much milder character, so that they are often overlooked altogether, being absorbed in the violent pains of distant organs, to which this affection gives rise, usually denominated hysterical.

These sympathetic pains are observed in all parts of the body;—indeed, the disposition to wander, which more or less belongs to all neuralgic affections, is particularly remarkable in that which originates in the uterus. Sometimes the lower extremities are affected; sometimes the thorax; especially underneath the left breast; but most frequently, some part of the abdomen is attacked, particularly the right and left hypochondria, the region of the cœcum, and the descending colon. These pains are often very severe, giving rise to the suspicion of acute inflammation in the organs where they are situated.[2]

In many of these cases, there is, especially at the commencement, evident derangement of the uterine functions; such as leucorrhœa, dysmenorrhœa, bearing down sensations, pain over the sacrum and loins, &c. Often too, where an examination of the womb is practicable, this organ will be found in a state of morbid tenderness.

This train of symptoms is commonly observed in young girls, approaching the period of puberty; it often appears at every return of the catamenia; or from other causes which excite uterine irritation.

It may proceed from congestion or chronic inflammation of the

[1] Dr Gooch on Diseases peculiar to Women.
[2] See Dr. Addison on the Disorders of Females.

womb; from tumours, or from organic disease of that organ; or it may arise from idiopathic hysteralgia, unaccompanied with any appreciable disease of the uterus.

In these cases, much benefit may be derived from diffusable stimulants, or antispasmodic remedies, such as valerian, galbanum, assafœtida, opium, &c. Sir B. Brodie has found pills of sulphate of copper very useful, when persevered in for a sufficient time. Dr. Addison recommends the injection of astringent lotions into the vagina.

Where there is painful menstruation, or symptoms of congestion of the womb, I know no treatment so effectual as the application of a few leeches to the groin or sacrum. I have seen many cases where immediate relief was obtained in this manner, even where the symptoms closely resembled those of visceral inflammation. Other remedies may also be employed at the same time.

CASES.

CASE I.

Sarah Willis, aged fifty-six, 28th July, 1836.—On Friday morning, the 22d instant, she was suddenly seized with acute pain in the epigastric and umbilical regions, attended with diarrhœa and frequent vomiting.

These symptoms were removed immediately after swallowing the second dose of a mixture which she procured from a druggist; but at the same moment, her voice left her, and she has not since been able to speak, except in a whisper. There is no pain or tenderness over the trachea or larynx. Pulse 100, soft; tongue clean and moist; bowels now constipated. A laxative mixture was prescribed on the 30th, when the bowels were acted upon freely, and the voice instantly returned.

CASE II.

Lucy Payne, aged twenty-nine, May, 1836.—Complains of an unpleasant tingling sensation, which commences at the corners of the mouth, and runs over the upper lip, meeting in the centre. It then divides into two streams, which pass along each side of the nose, again uniting at the pons nasalis.

These attacks are irregular, and are not attended by much suffering, but she experiences, several times a day, sudden shocks of pain, which shoot through different parts of the body, and especially through the arms.

She has sometimes a sensation in the left cheek, as if the jaws were forcibly closed, although she can always separate them without difficulty. When this symptom disappears, it is often succeeded

by the spectral appearance of an eye, which she describes to be of a beautiful blue colour, surrounded by a bright margin of white. It seems to be at a distance of two or three yards, and about a foot below the level of her own eye. It never remains longer than a few minutes, and always vanishes suddenly. Latterly, she has been much troubled by a noise, resembling the fluttering of a bird, close to her left ear. The delusion is so complete, that she sometimes instinctively turns to examine the supposed cause of sensation.

Her general health is good, although the countenance is pale, and her spirits are much dejected. She was confined about three months ago, and is now suckling her child, having abundance of healthy milk.

A quinine mixture was prescribed, which she persevered in taking for some time, but with no benefit.

The strychnine aggravated all the symptoms, and also excited much nervous irritation. She was greatly relieved by a combination of cascarilla and soda, with a slight purgative, which she took for several months.

CASE III.

Emma Sherwyn, aged eleven, 10th August 1837.—About six weeks ago began to suffer from severe headache, and wandering pains of the chest and abdomen. Shortly afterwards, she was attacked with paroxysms of chorea, in which the spasmodic actions were so severe, that it became necessary to employ restraint, in order to prevent her being thrown with violence against the boards which surrounded her bed. The head was a little relieved by blisters and leeches, but no impression had been made upon the convulsive motions by that or any other means. About the beginning of July, they left her suddenly, and she began to utter a monotonous kind of yelling, so loud, that the police insisted upon entering the house to learn the cause of disturbance.

She went on in this manner for about a fortnight, sometimes being attacked with the chorea; at others, making these involuntary cries; afterwards, she began to be much anoyed by the spectral figure of a black cat, which appeared sitting upon the dresser, on the opposite side of the room, staring her in the face for several hours together.

This figure did not vanish suddenly, but when it was about to disappear, its outline became gradually fainter, until it was no longer distinguishable. After a few days, this symptom left her, but she was now seized with acute pain of the left arm, which commenced at the elbow, and extended over the radius, almost to the wrist. From the commencement of her illness there has always been great difficulty in procuring the action of the bowels, notwithstanding that strong purgatives were employed for that purpose.

The stools are black and offensive; the appetite voracious; the intellect clear, and even unusually vivid.

June, 1838.—These symptoms continued to recur at irregular periods, for several months, during which time every remedy which could be suggested was tried without effect: the treatment was afterwards chiefly confined to the employment of purgatives, and she gradually recovered.

The mother of this child and an elder sister began to menstruate in their eleventh year. The breasts are, in the present instance, rather developed, but no other sign of puberty is present.

CASE IV.

Mrs. Lowrie, aged sixty; 18th February, 1834.—For several years, particularly at the commencement of the spring, she has been subject to an annoying pruritus of the left leg, sometimes attended with tingling sensations and slight shooting pain. The attacks are generally preceded by a feeling of cold in the affected limb; there are no external marks of disease; she has taken purgative medicine, and used many local remedies, without relief. The itching was considerably subdued by a few doses of the subcarbonate of iron.

CASE V.

Phœbe Wilson, aged thirty-six; Feb. 24th, 1834.—Experiences a sensation as if a stream of cold air was directed over the left fore-arm and hand. She has several of these attacks in the course of the day, but they do not observe any regular interval, and are unaccompanied by pain. Tenderness, however, over the lower cervical vertebra is perceptible.

Appl. emplast. lyttæ. spinæ. Mistura laxans.

March 2d.—Less spinal tenderness. Cold sensations still felt.

Applicentur cucur. cruent spinæ. Rep. mistura.

10th.—The paroxysms have left her; there is a slight degree of rigidity in the muscles of the left arm, preventing her grasping any thing firmly.

Rep. Mist.

17th.—The power of the arm is completely restored. No return of the cold sensation.

CASE VI.

John Cummins, aged thirty-three, formerly night patrol; 3d June, 1836. Is subject to frequent paroxysms of pain, which commence over the left superciliary ridge, and dart across the forehead; sometimes they pass through the eyes, occasioning momentary blindness, and a copious flow of tears.

When the paroxysm is at its height, the pain frequently passes in an instant from the head to the epigastrium, where it continues for several minutes, and terminates with the secretion of a thin incipid fluid from the stomach.

After walking until he is fatigued, the pain commonly removes to the loins, and darts down the thigh to the knee and foot. It attacks the arms also, when he makes any unusual exertion with them.

His spirits are dejected; tongue clean; appetite good; bowels regular; pulse ninety, weak; no spinal tenderness.

His symptoms began about three years ago, when he was seized with pain in the lower jaw; afterwards, it passed successively to the hollow of the cheek, the external ear, the vertex, and the parts which it occupies at present.

Many remedies were given to this patient without permanent advantage. The pains were for a time mitigated by cupping between the shoulders; they were much aggravated by the carbonate of iron, after each dose of which the head was attacked with renewed violence. Almost complete relief was obtained for some days by his taking the extract of nux vomica, but the benefit derived from this drug also proved transient. Upon one occasion, when he was trying it, a pain attacked the left testicle, where it was beyond comparison greater than any he had previously experienced; it appeared to dart through the centre of the testicle, but ceased in a few moments, and did not recur during the time he was under my care, which was several weeks.

CASE VII.

Ann Dillon, a cook, aged forty; admitted June 24th, 1836.—Three months ago, she punctured with a sharp pointed knife the muscular portion of the right thumb, over the abductor pollicis. The wound bled profusely, and occasioned great pain, but healed rapidly. For several days after the accident, the pain was confined to the wounded spot; but it afterwards attacked the wrist, and from this point darted along the thumb, the indicator, and middle fingers.

At present there is no pain over the seat of the original injury, but when the cicatrix is pressed, an aggravation of the above symptoms ensues. There is considerable tenderness over the lower cervical and upper dorsal vertebræ.

Capiat ferri subcarb. ʒ i, ter die, et pil aperient ii. o. n. The hand to be supported.

June 27th.—The pains now fly up the arm to the axilla, and to the right mamma, covering a space on the external side of the nipple, about the size of a crown piece. Several of these paroxysms occur in the course of a day, during which, the skin over the affected portion of the breast is streaked with red lines.

Capiat nucis vomicæ extract: alcohol: gr. ½, ter die. Mist. laxans.

July 8th.—For the last two nights, the pain was most intolerable, entirely preventing sleep. It continued with the greatest intensity until this morning, when the catamenia appeared, and nearly at the same moment the pain of the breast and arm completely subsided. It is now again confined to the wrist and fingers, and even there is less severe; the spinal tenderness has disappeared.

July 16th.—The pain is gradually subsiding.

The following is the subsequent history of this case:—At the next return of the catamenia, a relapse took place; the pain shot up the arm, and attacked the mamma, and the spinal tenderness reappeared; both of which symptoms immediately vanished when the secretion was established. The same phenomena occurred in the two successive months, except that the sufferings were of a mitigated character.

In the mean while, the original pain of the wrist and fingers subsided; and pressure of the cicatrix could be made without much uneasiness. The patient was enabled to resume her occupations.

CASE VIII.

William Clerk, aged forty; 18th March, 1837.—Suffers acute lancinating pains over a space about the size of half-a-crown on each side of the occiput. The paroxysms are irregular and very frequent.

His complaint began last Christmas, after he had been exposed for several hours to a heavy snow storm; when he was retiring to bed on the same evening, he found the hair over the back of the head completely wet from the melting of the snow, and the occiput felt benumbed. On the following morning he awoke with his present symptoms, which have gradually become more severe.

He has taken, under my direction, quinine, carbonate of iron, strychnine, belladonna, and stramonium, but no relief has been obtained.

The head to be shaved over the occiput, and a blister applied over the seat of the pain on the right side of the head.

19th.—The blister rose well; he thinks the pain rather increased to-day.

The cuticle having been removed, about ¾ of a grain of the strychnine was sprinkled over the abraded surface.

Pulv. Cathart.

20th.—Had a better night; the pain is a little relieved this morning. Repeat the strychnine as before.

21st.—He has had no pain over the blistered surface since yesterday; the complaint has not abated on the left side of the occiput.

A blister to be applied to the left side of the head, and dressed with strychnine. Rep. pulv.

28th.—The head is almost entirely free from pain on both sides; sleeps well; complains of debility; both the blisters have healed.

Mixt. quinin. sulphat. Rep. pulv.

April 3d.—Feels altogether much better; no return of pain. Discharged at the end of the month, cured.

CASE IX.

Elizabeth Hawker, aged fifteen; 17th November, 1836.—About ten or twelve times a day, she is seized with a paroxysm of excruciating pain, which begins at the sides of the neck, about three inches above the clavicle, and shoots along the course of the vessels to the posterior part of the ears and sides of the head. It is felt in precisely the same situations on both sides, but it is much more severe on the left.

The attacks are sudden, having no precursory symptoms. Their duration varies from a few minutes to a quarter of an hour. They frequently occur in the night, rousing her from sleep, and compelling her to cry out violently. The intermissions of pain are complete; there is no tenderness over any portion of the spine, or over the wounded part of the scalp; the countenance is pale and anxious; pulse and tongue natural; bowels regular; the catamenia have not yet been established.

About six months ago, she fell against a grate, and received a blow on the right temple. For two months after this accident, she was occasionally attacked with pain resembling her present symptoms, but of a much milder character. From that time, until within the last six weeks, she has been quite well. Blisters and leeches gave no relief.

Capiat. pil c. extract stramonii. gr. ¼ tertia quaqué hora. Mist. laxans.

18th.—A few minutes after swallowing the second pill, the pain flew from the head to the shoulder, in which part the paroxysms continued to recur during the night. She has had several hours' sleep this morning; the pain is now felt alternately in the shoulder and occiput.

Rep. pil. extract stramonii. gr. ½ quater die. Mist. laxans.

19th.—Slept well; the paroxysms are confined to the side of the head.

20th.—The attacks have distressed her all night, recurring nearly every ten minutes; pupils dilated; dryness of throat.

Omitt. pil. stramonii. Pulv. ferri subcarb. 3 ij. ter die. Rep. mistura.

21st.—Only one paroxysm since yesterday.

Rep.

22d.—No attack. She frequently experienced numbness in the parts which were formerly the seat of pain.

Rep.

29th.—Feels quite well. Discharged cured.

June 25th, 1838.—This patient has had several neuralgic attacks since the date of last report, in which the pain was chiefly confined to the scalp over the right parietal bone, and was excited when pressure was made over the seat of the accident; indeed this spot was at times so tender, that the contact of the lightest substance caused much suffering, which once terminated in an epileptic paroxysm.

The pains were for some time checked by the subcarbonate of iron, but in the more recent attacks this remedy seemed to have lost its power over them. Relief was twice obtained by covering the old cicatrix with lunar caustic. She has now been entirely free from pain for six months, at which time the catamenia became regularly established. The cicatrix, as well as the whole of the scalp, may now be examined and pressed without occasioning any pain.

CASE X.

Charles Wormald, aged fifty-seven, porter; December 4, 1834.—About three weeks ago, in consequence of some accident, a heavy weight was suspended from his left arm for several minutes. When he was released, he felt severe pain in the shoulder, which soon afterwards began to dart through the inside of the arm to the fingers, and, nearly at the same time, through the course of the sciatic nerve.

The hand cannot be raised to the head, partly on account of the sufferings which this motion occasions; but there is also an evident diminution of power in the muscles themselves. He is very lame. the biceps cubitus muscle sometimes contracts spasmodically. The tongue is white; appetite good; pulse natural.

Applicentur cucurb. cruentæ spinæ. Pil. hyd. submur: co. gr. v. bis die. Mist. laxans.

7th.—Less pain of shoulders; bowels constipated.

Rep. pil. Pulv. cathart.

11th.—No improvement.

Capiat nucis vomicæ extract: alcohol. gr. ½ ter die. Rep pulv.

18th.—The pain is less severe, and he can now raise his arm with tolerable ease.

Rep.

29th.—He continued to take his medicine until to-day; he now feels well. Discharged cured.

CASE XI.

Mary Ann Kennedy, aged eleven; Nov. 1837.—Several times a day she is attacked with the following symptoms:—an obscure aching pain occurs along the edge of the inner false ribs, which rapidly grows more acute, and at length darts to the epigastrium,

covering a space not broader than the finger; after a few minutes the paroxysm subsides, and she is completely free from pain.

Her complaint is attributed to a blow over the chest, received about twelve months ago. A paroxysm resembling those from which she now suffers, appeared on the evening of the accident, and attacked her several times each day, for nearly a month afterwards. About three months ago, the sufferings were renewed without any evident cause. The general health is good; tenderness exists over the middle dorsal vertebræ, pressure upon which excites the epigastric pains.

Appl. emplast. canthar. parti dolent. spinæ. Mistura laxans.

12th.—The paroxysms are somewhat less violent.

Rep.

30th.—She has had no pain for several days, until yesterday, when the paroxysms reappeared.

Rep. emplast. lyttæ spinæ. Rep. mist. laxans.

Dec. 5th.—Much relieved; no spinal tenderness perceptible.

Rep. mist. ferri subcarb. gr. xv. ter die.

Jan. 3d, 1838.—No pain for the last fortnight. Discharged cured.

CASE XII.

Sarah Johnson, aged fourteen; 21st Nov. 1836.—Has been subject to acute lancinating pain for several months, which darts across both hypochondria, towards the navel. The paroxysms occur several times a day. There is great tenderness over the dorsal vertebræ, on a level with the seat of the pain; and also over the lower lumbar vertebræ.

She has never menstruated, but has occasionally had a watery discharge from the vagina.

App. emplast: lyttæ lumbis. Pil. aperient. ij. o. n.

24th.—The blister rose well, and the abdominal pains have not since returned.

28th.—No return of pain. The spinal tenderness has also disappeared.

5th Dec.—Discharged cured.

CASE XIII.

Mary Copeland, aged sixteen; September 24th.—This patient has severe pain over the lower part of the abdomen, increased when pressed upon; for which, she says, a blister and leeches have been applied over the affected part without any relief. Pulse 100; skin cool; tongue moist; bowels confined; the catamenia are scanty and irregular, and always accompanied with severe pain. Excessive tenderness over the lumbar vertebræ.

Appl. Hirud: viij. inguini. Mist. camphor et valerian. Pil. aperient. ij. o. n.

25th.—Leeches bled well; several alvine evacuations. The pains have disappeared. Discharged cured.

CASE XIV.

Sarah Budd, aged thirty-five; 7th August 1836.—For the last seven or eight months she has been subject to acute lancinating pains, which dart from the left mastoid process over the side of the head to the vertex. There is much tenderness on pressure over the second and third cervical vertebræ. She has been cupped on the back of the neck; leeches and blisters have been repeatedly applied to the head, and she has taken a large quantity of medicine from different practitioners, without benefit.

Capiat ferri subcarb. 3 i. ter die. Mist. laxans.

September 6th.—No improvement. A few days ago, she discovered a little hard tumour, not larger than the head of a pin, towards the upper part of the left parietal bone, which was painful when touched. As she refused to have it removed by an operation, it was cauterised, and the wound was kept open with the savine ointment.

9th.—The sore discharges healthy pus, and is less tender; other symptoms as before.

Continue.

12th.—She can now suffer the wound to be handled; the cervical tenderness is also decreased, and the pains of scalp less severe.

App. emplast. lyttæ spinæ. quà dolet. Pil. aperient. ij. o. n.

16th.—Spinal tenderness gone, and the other pains are seldom observed.

October 10th.—She called to say that she has never had the least return of her former symptoms.

CASE XV.

Elizabeth Sanger, aged forty-five, widow; August 20th, 1837.—For the last seven years, she has been subject to palpitation and dyspnœa, which have latterly become much more frequent; the pulsation of the heart can be distinguished over the whole anterior and left posterior regions of the chest. She has a continual aching in the left precordial region, and, occasionally, paroxysms of lancinating pain; one of these generally comes on about eleven o'clock, and another at four in the afternoon. Great tenderness exists over the dorsal vertebræ, pressure upon which induces the thoracic pains. The tongue is clean; the appetite variable; the catamenia regular.

Appl. emplast. bellad. lateri sinistræ thoracis. Pil aperient. ii. o. n. Mist. camphoræ et digitalis.

12th.—The paroxysms of lancinating pain have been less severe; spinal tenderness gone.

Rep.

22d.—Feels much relieved.

CASE XVI.

Charles Gregory, aged forty, watchman; 3d January, 1834.—He is attacked several times a day with pain, which shoots along the inside of both arms, from the elbows to the wrists, and is occasionally felt in the thighs and knees, being accompanied by a thrilling sensation in the affected parts. There is tenderness over the middle dorsal vertebræ; his pulse is jerking, but otherwise natural.

About three weeks ago, he fell from a height of several feet upon his back, and was carried home in a state of insensibility, in which he continued for some hours; he afterwards began to feel numbness of the palms of the hands and fingers, and occasionally of the calves of the legs and feet, causing some awkwardness in walking. As these symptoms subsided, his present complaints gradually came on.

Ft. venæsectio ad ʒ xiv. Mist. laxans. Pil. hyd. subm. comp. gr. v. bis die.

From this time the pain rapidly disappeared.

July 17th.—To-day this patient applied again for relief. He states, that with the exception of a feeling of debility, he had enjoyed good health until last Thursday, when having received a severe blow on the chest in the performance of his duty as a watchman, he was almost immediately after seized with vertigo, which terminated in a fit of epilepsy. He now again complains of the same pains of the limbs as formerly; there is great tenderness over the middle dorsal vertebræ; the tongue is coated with bile, of which he yesterday vomited a large quantity.

Applicat. C. C. parti dolent. spinæ. Pil. Hyd. gr. v. o. n. Mist. laxans.

Aug. 4th.—No fit; numbness of the fingers; much less pain.

Rep.

25th.—Feels pretty well.

October 18th.—He enjoyed tolerably good health until last week, when his old symptoms returned in an aggravated form, without apparent cause. He had suffered much pain of the back, which was greatly relieved by cupping; he now complains of severe headach.

App. emplast. lyttæ. spinæ. Mist. laxans.

23d.—The headach is very distressing; the pulse ninety, very small; the countenance anxious; the bowels regular; he is emaciating rapidly.

30th.—He continued to sink gradually; and for the last five days he had not been able to pass his urine without the catheter.

About twelve o'clock yesterday morning he fell into a comotose state, and died at nine last night.

Sectio cadaveris.—Brain.—Increased vascularity of the dura mater, which adhered firmly to the arachnoid, about the middle of the left hemisphere, at the margin of the sulcus, dividing the two hemispheres. A small quantity of lymph and osseous matter were found on this spot. The arachnoid had a cloudy appearance, and seemed thickened. The pia-mater was much injected. The substance of the brain was firm, except a portion of the right thalamus, which was reduced to a pulp. About two ounces of bloody serum were contained in the ventricles. The theca of the spinal marrow adhered firmly to the spinal canal, at the fourth dorsal vertebra. Considerable serous effusion under the theca. The nerves passing from the spinal marrow to the third and fourth dorsal vertebræ, are extremely vascular. About the seventh dorsal vertebra, the medullary matter was reduced almost to a liquid state, for rather more than an inch. There was nothing remarkable in the other viscera.

CASE XVII.

Thomas Rushen, aged forty, watchman; 19th April, 1834.—About a month ago, he was attacked with an extremely acute lancinating pain in the left wrist, which after remaining in that situation a few hours, suddenly changed to the left elbow, and subsequently to the right knee. The pain has returned at irregular intervals, to one or other of the above situations; but during the last two or three days, the attacks have been confined to the knee. Pulse and tongue natural; no heat or swelling of the affected joints, which can be moved freely, without materially increasing the pain; but he says that the paroxysms are excited by walking.

Mist. cinchonæ c. tinct: guiac. ammon. Pil. aperient. ij. o. n.

21st.—Several paroxysms occurred yesterday, the pain being confined to the right knee.

Capiat nucis vomicæ. extract. gr. ¼ ter die. Rep. pil. aper.

May 10th.—The pain commenced yesterday morning in the knee, but after a few minutes suddenly changed to the left elbow. It was of a milder character than usual, and the paroxysms continued a shorter period.

Rep. extract: nucis vom. gr. ½ ter die. et pil. aperient.

12th.—Continuing to improve.

Rep.

20th.—Is nearly free from pain. Discharged cured.

CASE XVIII.

Mary Legge, aged sixty-three; June, 1838.—For the last twelve years she has suffered from attacks of facial neuralgia in its most aggravated form. The pains occupied the angle of the jaw on the left side, the hollow of the cheek, the temple, and the gum.

Since the commencement of her complaint, the pain has sometimes been completely suspended for three or four months, and has again returned without any perceptible cause.

About two years ago, after having enjoyed a long respite from the attack, it was renewed with great violence. Every remedy that could be suggested was tried, without avail, by myself and other practitioners, when the pain suddenly flew from the face to the left arm, near the insertion of the deltoid muscle. It continued there in paroxysms for several days, and then returned to its former situation.

An issue having been made in the arm, the attacks were again drawn from the face; and so great was the relief, that although the pain of the arm was considerable, she almost disregarded it, through the comparison she made with her late sufferings.

The issue has now been open fifteen months, since which the facial neuralgia has been nearly suspended; it has, however, returned occasionally, for a few days, but a little purgative medicine is now usually sufficient to subdue it; or, when this fails, the application of stimulating ointment to the issue has always proved successful. The pain of the arm returns frequently, but it has not been latterly of violent character.

She attributes the commencement of her sufferings to sitting, during several years, for many hours each day, in the open window of a ham-shop, where the left side of the face was exposed to the cold air; she had, however, quitted her place before any symptom of the neuralgic affection appeared.

CASE XIX.

Edward Hayman, aged forty, tailor; March 15th, 1837.—Was attacked yesterday morning with severe shooting pains over the left temple, which continued for several hours, leaving a dull pain over the affected part. A similar paroxysm occurred about seven o'clock last night, which lasted until twelve, and then subsided. He slept well; the tongue is clean; the appetite good; the bowels regular.

Extract. bellad. gr. ½ tertiâ quâque hora. Mist. laxans.

16th.—A severe paroxysm this morning at nine o'clock, which continued until one.

Rep. pil. et mistura.

17th.—Vertigo came on yesterday, consequently the pills were discontinued. He had a severe paroxysm of pain to-day, at seven o'clock. The blister rose well; and the cuticle having been removed, about ½ grain of strychnine was sprinkled over the surface.

18th.—No return of pain yesterday; but this morning about seven o'clock he had a paroxysm, which was much less severe than formerly.

Two thirds of a grain of the strychnine was applied to the blistered surface. Mist. laxans.

19th.—Rather acute pain for about half an hour after the application of the strychnine, but none since. The blistered surface is dried up.

Rep. mistura.

23d.—Scarcely any pain since last report. Discharged cured.

CASE XX.

Samuel Deshon, aged twenty-eight, pocket-book-maker; 28th July 1838.—Has suffered for the last seven weeks from paroxysms of acute lancinating pain, which commence over the deltoid muscles, shoot down both arms, terminating on the right side (where it is most severe) in the middle finger; and on the left, in the middle and ring fingers. Before the occurrence of these symptoms, he had been affected for several days with shooting pains in the right side of the head; but they left him suddenly and flew to their present situation. The attacks come on at eight o'clock every night, and continue until four in the morning, entirely preventing sleep during that time.

Scarcely any mitigation of his sufferings having been procured by any mode of treatment, a quantity of morphine, not exceeding the sixteenth part of a grain, previously moistened with a little water so as to form a paste, was inserted under the cuticle over the right deltoid muscle. Four punctures were made, about the distance of an inch from each other. In a few seconds, a white tubercle, nearly circular, was distinctly visible in the situation of each puncture, gradually increasing in size, until it resembled the mark occasioned by a bug-bite. Each of these tubercles was surrounded by an areola, the margins of which subsequently communicated, so as to give the arm an erythematous appearance; at the same time, tingling and pricking sensations were felt over the spot, which continued for about two hours, when every trace of the action of the morphine disappeared.

Although this process was employed during the intermission, the pain did not return in the right arm that night; it was still felt in the left arm, but did not prevent the patient from sleeping the whole night, for the first time during several weeks. On the following morning, the same treatment was applied to the left arm, and with a similar result, and the symptoms permanently disappeared. No general narcotic effect was occasioned by the morphine.

OBSERVATIONS

ON THE

CONDITION OF THE INSANE POOR.[1]

[The following facts and arguments are extracted from "An Appeal to the People of Pennsylvania on the subject of an Asylum for the Insane Poor of the Commonwealth." The appeal was prepared by a committee, of which the editor of the "Library" was chairman; the laudable object of the association by which the committee was appointed, being to take into consideration the propriety of adopting measures to establish, at public expense, an asylum for the insane poor of Pennsylvania. The editor's colleagues on the committee were Fred. A. Packard, Esq. and Caspar Morris, M. D.]

The condition of the insane poor in this commonwealth has for some time been a topic of absorbing interest with the philanthropist. Of the different forms of misfortune and misery, insanity excites the most painful emotions. The horror which it occasions in the minds of most persons; the utter helplessness of the afflicted; and the degradation and cruelty to which they are too often subjected, render them peculiarly the objects of benevolent solicitude.

* * * * * * *

It has been a matter of statistical investigation in many countries of Europe, and in various states of this Union, to discover the ratio of insane, and especially of insane poor, to the rest of the population. Unfortunately, the estimates on this subject have not been made in such a manner as to command implicit reliance, with the exception perhaps of those of Norway. In the year 1825, the Storling directed that a special enquiry on this subject should be instituted, the results of which have been published by Dr. Holtz. In 1829, Sir Andrew Halliday furnished a tolerably accurate estimate of the number in England and Scotland; and Dr. Brièe de Boismont, well known for his researches in regard to the insane, has given the number in twenty-one establishments in the principal cities of Italy, which he visited in the year 1830.

The estimates of different observers have been collected by Esquirol, and others: from these it would appear, that in England, the proportion of insane to the whole population is 1 in 783; in Wales, 1 in 911; in Scotland, 1 in 573; in the Rhenish provinces,

[1] An Appeal to the People of Pennsylvania on the subject of an Asylum for the Insane Poor of the Commonwealth. 8vo. pp. 24. Philadelphia, 1839.

1 in 1000; in Norway, 1 in 551; in France, 1 in 1750; and in Italy, 1 in 3785; the limits, consequently, between the number of the insane compared with the population being, in Europe, between 1 in 550, and 1 in 3785; a wide and singular difference, and one by no means easy of explanation. Esquirol suggests, that owing to Norway and Scotland being mountainous countries, idiots are more numerous than in those which are more level; idiocy or mental *imbecility*, he conceives, being owing to physical circumstances connected with locality, whilst madness or mental *perversion* is the product of society and of intellectual and moral influences; in idiocy causes have interfered with the development of the organs, whilst in madness the over-excited brain has transcended its healthy boundaries. But although locality has, doubtless, its influence in the production of certain forms of insanity, as of other diseased conditions, it is impossible to regard the rule absolute when we refer to the enumerations of Europe or of this country,—the proportion in Wales, which is extensively mountainous, being small, and that of Italy, traversed by lofty ridges, the least in the tables.

In this country, the proportion of the insane to the rest of the population has been largely overrated.

From extremely inadequate data, it was affirmed by an able writer, a few years ago, that the ratio in the United States was as high as 1 in 262; and this affirmation was made in the face of the enumeration of the State of New York, in 1825, which has been adopted by Esquirol and other writers on the statistics of insanity, and which showed, that there was in that state 1 insane person to every 721. As the State of New York contains nearly one-sixth part of the population of the Union, any accurate enumeration afforded by it merits every attention. In the year 1825, the proportion of the insane there to the whole population was 1 to 1974 nearly; of idiots, 1 to 1138 nearly; and of both classes, 1 to 721 and a fraction. In 1835, on a fresh enumeration, the proportion of insane was 1 to 2249 nearly; of idiots 1 to 1465 and a fraction; and of both classes 1 to 887 and a fraction, thus exhibiting a diminution in the ratio in the last ten years—under the presumption that the enumerations were equally accurate—in the ratio of 887 to 721, and showing, that in New York at least there has not been that increase in the number of the insane, which has been considered to have taken place to an alarming extent elsewhere.

Estimates have been made as to the number of the insane in some of the New England states, but although those states have been amongst the foremost in ameliorating the condition of these unfortunates, there does not appear to have been sufficient extent of statistical details; the general estimates being commonly deduced from partial enumerations, from which it has been attempted to infer the proportion in the whole state.

As respects the precise ratio in the commonwealth of Pennsylvania, we have no enumerations on which reliance can be placed;

but evidence enough exists to show that it is considerable. In the single almshouse of the city of Philadelphia there are in the lunatic department at this time 174 patients—90 males and 84 females; and in other parts of the establishment 50 or 60, who are more or less fatuous; and as these are chiefly from the county of Philadelphia, we may presume that the proportion in the whole state is at least as great as in the neighbouring State of New York; that is, as we have shown, 1 in 887 and a fraction, making about 1800 insane persons in Pennsylvania; but presuming that it is not higher than 1 in 1000, there must be in the state, of all clases, at least 1600 insane. If, then, we take again the State of New York as a guide,—in which the proportion of idiots in 1835, was as 1484 to 967, or three-fifths of the whole number,—the number of lunatics in Pennsylvania may be estimated at 600 or 700, and of idiots at 1000 or 1100,—and this is probably a low estimate.

Granting, then, that there are from 1600 to 1800 insane persons in this state, it is an interesting enquiry to determine what proportion of these are supported by their friends,—at home, or in some of the excellent establishments which exist among us; how many are in a state of destitution, and what number are already receiving that assistance which the almshouses are capable of affording.

Now, the results of all enquiries on this matter have shown, that persons in easy circumstances are far less subject to insanity than those who are indigent, and too often intemperate.

The ratio of the insane amongst the indigent classes, as given by Sir Andrew Halliday, is indeed surprising: of 14000 insane persons in England and Wales, 11000 are supposed by him to be indigent. In the census of the state of New York, taken in 1835, it is stated, that of 967 lunatics, (that is, exclusive of idiots) 382 were supported by charity, and 312 were able to support themselves—leaving 273 not classified, but who, it is affirmed, were, doubtless, in indigent circumstances. This is proved, indeed, by the abstracts of the returns of the superintendents of the poor of the state of New York, from which it appears that 652 lunatics were relieved, or supported during the year ending the 1st December, 1837. This number added to 312, the number reported in 1835 as of sufficient pecuniary ability to support themselves, gives an aggregate of 964,—only three less than the whole number of lunatics in the state in 1835.

From the same documents we learn, that of the 1484 idiots, the whole number in the state in 1835, 514 were supported by charity, and 549 were possessed—directly or indirectly—of sufficient pecuniary ability to support themselves, leaving 421 not classified.

It would seem, however, that during the year ending the 31st of December, 1837, not more than 249 idiots were supported or relieved by the superintendents of the poor; which is ascribed, by the secretary of state of that commonwealth, to their being generally harmless, with little or no hope existing in the minds of their friends of restoration; and therefore they are supported at home by their families, aided by the private charity of neighbours;—an inference

which is confirmed by the facts relating to the deaf-dumb, less than two fifths of whom, in unquestionable indigence, are supported or assisted by the public authorities; the remaining three fifths being provided—and too frequently wretchedly provided—for at home, partly by their relatives, and partly by private charity.

In other states of the Union, attempts have equally been made to determine the number of insane who are supported by public or private bounty. Of these—as probably the most accurate and comprehensive—we may adduce the results laid before the general assembly of Connecticut in May last, by a committee appointed by the assembly to ascertain the number, age, sex, and condition of the lunatics of that state; also to ascertain the best and most effectual means of relief, the amount of money necessary to be expended for the establishment of an appropriate institution, and other relevant matters.

The enquiries of this committee, by whom an able report was drawn up and presented, were confined to the number of the destitute, who were either supported by the towns or by charity; and from their summary it appears, that in 118 towns of that commonwealth there were 129 males and 192 females entirely supported by the towns; 86 males and 59 females partly supported, or receiving assistance from the towns, and 100 males and 141 females supported by charity;—in all, 707 insane and idiotic were returned, of whom 59 were in confinement.

It is probable—although we have no exact statistical information —that the number in the towns of Pennsylvania, of equal population, is less than in those of Connecticut; but we have no reason to believe that it can vary much from those of New York.

Recurring to this, then, as our foundation, we may infer that of the 600 or 700 lunatics—the presumed number in Pennsylvania, exclusive of idiots—from 400 to 500 might require the assistance which the contemplated charity is capable of affording.

The evils that result from the want of such an establishment are comprehended in their full extent by those only whose opportunities, inclinations, or duties, have led them into a close investigation of the subject.

Although the period has passed away when the insane were thought to be possessed of demons, and therefore to be shunned and despised, the notion is still too prevalent, that but little advantage is to accrue from the most skilful medical management; and, consequently, that the establishment of any extensive institution for their restoration is an unnecessary tax; and that nothing farther is needed than to protect the community from the attacks of the furious and the malevolent. This erroneous view has been the source of much mischief, and has led to the practice adopted in many countries—indeed to a certain extent over the whole of this and other states—of committing the refractory lunatic to the common jails or penitentiaries, where he may be safely kept from injury to others, but where he can of course receive neither appropriate

medical nor moral treatment. When, indeed, a prisoner is pronounced insane in our higher courts of justice, he is doomed to the cell of the convict, to pass there the remainder of his wretched existence, punished for offences of which he must be esteemed innocent; and immured for a mental infliction which might often certainly be removed under judicious management in a proper asylum. Yet, in the absence of such an asylum, this course is inevitable; and it is the source of much solicitude to every judge possessed of the kindlier sensibilities.

In the earlier ages, when sound philosophy was but little cultivated, and every infliction of the kind we are considering was regarded—as it must be—one of the most awful of the dispensations of the Almighty, it is not surprising that it should have been believed to set at defiance all attempts at explanation, and the best directed efforts for its removal. Modern science and philanthropy have, however, afforded the most signal evidence of the inaccuracy of the ideas of our ancestors in relation to the curability of this disease,—for disease it doubtless is,—and one essentially physical in its character, although after it has continued for a certain time not capable of being materially influenced by ordinary physical remedies.

When the late Dr. Willis—well known as the physician to whose immediate care the then king of England, George the Third, was entrusted during his first attack of insanity—stated, in his evidence before a committee of the British parliament, that 9 out of 10 cases of insanity recovered, when they were placed under his care within three months from the first attack, his assertion was discredited by both the unprofessional and the professional; yet its accuracy has been since amply established. Dr. Burrows, of London, in one of his works on insanity, reports the ratio of cures, in his experience, to have been 81 in the 100, taking the aggregate of all cases; 91 in the 100 in recent cases, and 35 in the 100 in old cases. Sir W. C. Ellis affirms, that of 312 patients, admitted into the York West Riding Lunatic Asylum within three months of the attack, 216 recovered;—a somewhat smaller proportion than in the cases above mentioned, yet in the highest degree satisfactory.

Nor has the experience of our own country been less encouraging. In the asylum for poor lunatics at Worcester, Massachusetts, —of the patients admitted during the year ending Nov. 30th, 1835, whose insanity was of less than twelve months' duration, the recoveries were 82½ per cent. Of the old cases, for the same time, only 15½ per cent. In the M'Lean asylum at Charleston, in the same state, the ratio of recoveries in recent cases—that is, of those not over one year's standing—was in 1837, 864 per cent.; of old cases, 38 per cent.; and of all about 71 per cent.

It is essential to bear in mind this immense difference in the curability of insanity in recent and in chronic cases,—9 out of 10, it will have been observed, when the disease has existed under three months; and 8½ in 10 when it has existed under twelve months:

whilst, in chronic cases, not more than 4 in 10—if we take the highest estimate, that of the M'Lean Asylum, which, being founded on one year's observation only, can scarcely perhaps be esteemed decisive, especially when we mark the great difference between it and the results in other insane establishments. Sir W. C. Ellis states, that at the York West Riding Asylum, of 318 cases, that had existed from one to thirty years, only 26 were cured. Of 173 old cases, in the Bloomingdale Asylum, New York, in 1835, only 16 were restored,—and M. Esquirol, in a memoir published in 1816, and recently reprinted, and consequently confirmed by him, has asserted that after the disease has passed the third year of duration, the probability of cure is scarcely more than 1 in 30.

Can any thing exhibit more forcibly the necessity of *early* recourse to appropriate treatment?

We are told by the same enlightened and practised observer, that there were admitted into La Salpetrière—the extensive public insane institution at Paris—during the ten years from 1804 to 1813 inclusive, 2800 insane females; of these, 795 were found to be incurable, either from age, idiocy, epilepsy, or palsy; and 2005 were placed under treatment, without any regard being paid to the duration or character of the mental alienation. Of this number, 604 were cured during the first year, 500 during the second, 96 in the third, and 41 in the seven following years; from which M. Esquirol concludes :—1st, That the greatest number of cures is effected in the first two years; 2dly, That the mean term of cure is a little less than a year; and 3dly, That after the third year, as has been before remarked, the probability of cure is scarcely more than 1 in 30.

Contrast, now, M. Esquirol's second deduction, that the average term of cure is a little less than a year—and Pinel, his distinguished predecessor, estimates it at much less, between five and six months —with the published results obtained by a committee of the legislature of New Hampshire appointed to ascertain the condition of the insane in that state, in which there is no lunatic asylum. They report, that the average duration of the disease in their insane is between *thirteen and fourteen years!*

Yet, although the ratio of cures diminishes so largely as the disease is more protracted, no case ought to be adjudged desperate: many are the instances on record, and still more which have not been recorded, of persons who have been esteemed incurably maniacal or melancholic, and who have, notwithstanding, been restored to the full possession of their intelligence. Pinel gives the memorable case of a lady, who had passed twenty-five years in a state of mania, and who suddenly recovered her reason; and Esquirol that of a young girl, who had been for ten years in a state of incoherence, and who, one morning on rising, ran and embraced her mother, calling out, "O! mamma, I am cured." He states, also, that whilst he was at La Salpetrière, a woman who had been insane

from the period of puberty, was suddenly restored at the age of forty-two.

But it is now universally conceded, that in order for full advantage to be derived from medical and moral management, the insane should be removed from every object that may excite there hallucinations, to situations were all means and appliances exist to prevent the insane idea from obtruding itself; where they can have the advantage of the best medical aid, and of that moral revulsion, which air, exercise, and appropriate labour or amusement, are alone capable of affording.

Now, when we look at the condition of the insane paupers in this commonwealth, we find that no such provision exists for them; but that they may be divided into three classes; the first, comprising those who are retained at home; the second, those who are in the almshouses; and the third, those who are in the prisons or penitentiaries.

As regards the *first class*, it requires but slight reflection to determine, that their condition must be wretched in the extreme, and the prospect of cure almost null. It is every where admitted, that the chance of restoration is but slight, even amongst the wealthy insane, provided they are kept amongst the objects and scenes that are connected with their delusions. Generally, too, one of the first evidences of insanity is a dislike to those who were previously most dear to them, which is apt, indeed, to persist as long as the aberration continues. It is obviously, therefore, of moment to remove them from those sources of irritation to institutions in which they are soon taught to brook control, and in which every attention is paid to their comfort and restoration.

But if this applies to insane persons who are well to do in the world, how much more forcibly must it be applicable to such as are in the humbler spheres of life, and too often in the depths of destitution; doomed necessarily to neglect, abuse and privation. Their case is, indeed, most hopeless. It is now, we believe, the universal sentiment amongst the informed, that no case of insanity can be as satisfactorily treated in a private house, no matter how well regulated it may be, as in institutions established for the purpose. We well recollect how forcibly this conviction was impressed upon our mind by the *fatal* consequences of inevitable neglect, during the severity of winter, in a case, which was attempted to be treated at home; under the double impression, on the part of the family, that the ordinary servants of the house would be able to attend to the sufferer, and that there was something revolting in sending a relative to a public institution, where neglect was possible, and where he would be deprived of those cares, which relatives—it is too often erroneously conceived—are alone able to bestow.

The *second class*, the insane who are in the county almshouses, are of course in a somewhat better condition than those who are supported at home on public or private bounty; yet their state is in all cases far from what it ought to be, and in many cases deplorable.

There is every reason to believe, that the Philadelphia Almshouse, at Blockley, is a highly favorable specimen of those institutions, and that the medical and moral management of the insane is there on at least as good a footing as in any similar establishment in the state; yet so satisfied are the medical officers of that institution, of the inadequacy of their means of appropriate treatment, that a committee of their body has been appointed to suggest to the board of managers, whether some alteration cannot be effected by which a better classification of the insane may be practicable. As the building is at present arranged, the furious maniac is compelled to be placed in the same range of apartments with him whose reason is but slightly unsettled; and all attempts at proper classification have hitherto been futile. It is to be apprehended, indeed, that with every disposition on the part of the present board of managers to afford all facilities in their power, the arrangement of the building is such as to preclude any well founded hope of satisfactory modification. Could this, indeed, be accomplished, the lunatic would still be in want of those advantages, which a well regulated asylum, with its various establishments for labour and amusement, is capable of affording.

But if the Philadelphia Almshouse be thus defective, how much more objectionable must some of those institutions of a similar character be, which are situate in the interior of the country, remote from that influence, which is alone adequately felt in the vicinity of the larger cities. At the meeting held in Philadelphia, the furtherance of whose charitable objects is the occasion of the present appeal, cases were detailed of mal-treatment and neglect, sufficient to make the heart sick.

The very arrangement of an almshouse renders it, indeed, miserably defective for the purpose of an insane asylum. It rarely or never happens, that there is a resident medical superintendent. Usually, a physician, who is liable to be often changed from political or other motives, visits the establishment two or three times a week, and rarely stays sufficiently long to enable him to enquire into more than the acute cases of disease; the remainder, including the insane in a body, are generally postponed, neglected, or but inadequately attended to.

In the Philadelphia Almshouse, a resident physician—who is either a student, not a graduate, but proved, on examination by the medical board, to be competent for the office, or who has recently graduated—takes the immediate charge of the lunatic department for six weeks; the number of services during the year not permitting him to devote a longer period to any one of them. The attending physicians, who are non-residents, and on whom the charge of the lunatic, along with the other, wards really devolves—the resident physicians being required to act under their direction, are on service six months alternately, and generally pay daily visits; but as they have to attend to all the sick wards in that extensive charity, they cannot devote the necessary attention to the

lunatic department. This, consequently, is an imperfect substitute for a resident medical superintendent, permanently appointed to his office, and who is versed in the care of mental maladies, or capable of becoming so by rigid devotion to their investigation. Every change of the medical adviser gives occasion to exacerbations of the disorder, as the appearance of every stranger is daily seen to excite the maniac to vociferation and violence.

Under such an imperfect organisation of the lunatic departments of the county almshouses, we ought not to be astonished that there should be a comparatively small number of cures in recent cases, and that many, who, under a better system of management might have been restored, become incurably insane.

It has been before observed, that although insanity must be regarded as essentially a physical disease, it is not one which, after it has continued for some time, can generally be cured by such remedies as are known to remove ordinary physical excitement. The period soon arrives when a judicious moral management is the main stay of the physician. This, not one of our county almshouses is capable of affording.

By a proper classification of the insane, it will be found, that there are comparatively few who are incapable of participating in labour or amusement. Every well devised asylum should, therefore, be able to employ such of the patients as are fitted for the task, in agricultural or horticultural labours; workshops should be provided, and employment of some kind or other be carefully adapted to each individual. The attention, which such occupations require, produces a moral revulsion, and prevents the topic of hallucination from recurring; or if it recur, from wholly engrossing the mind of the lunatic. This is now so well understood, that in the different insane establishments of this country it is an object of anxious solicitude on the part of the medical superintendent, and the results have been most salutary.

"From the commencement," say the trustees of the Asylum for the Insane Poor in Vermont, "an excellent farm of about fifty acres was procured as a necessary appendage to the institution. We have been determined to have a fair trial made of employing the patients on the same, and have the effects strictly noticed. Here we add our own to the universal testimony of others on the subject, that useful labour for convalescents and all chronic cases is the best moral means that can be made use of in the treatment of insanity. It is difficult to divert patients from cherishing their hallucinations, unless some interesting employment is furnished for them. The patients thus employed are generally cheerful and happy during the day, and sleep quietly at night. The exercise gives them an appetite for food, and the whole physical system as well as the mind, seems to be thereby invigorated. It recalls to mind their former employments and pursuits, rouses into action those faculties of the mind which had before lain dormant, and gives rest to those which had been unduly excited. As the number

of our male patients has been small, not only the quiet, but also those who were more excited, have been taken on the farm; and, in every case, regular employment has been found very beneficial. No patient has been restricted in the use of tools, either at the wood yard, in the garden, or on the farm, and yet not the slightest accident whatever has happened. The patients consider themselves as enjoying the confidence of the officers, and make every effort that it should not be misplaced."

Sir W. C. Ellis deposes in his recent publication to the same beneficial results, feelingly depicting the obstacles that were thrown in the way of the introduction of manufactories into the admirable institution which he superintends. "Hitherto," he adds, "no accident of any consequence has happened from the patients being entrusted with tools, and no unpleasant result has arisen from the female patients, under proper charge of their nurses, working in the grounds or shops, where male patients, also, under proper care, have been at the same time employed. It is, however, possible that some untoward accident may happen; but even then I should be sorry the system should be given up. The injuries in one or two instances, are nothing in comparison with the constant and daily happiness which it affords to hundreds; and it is not possible, in this world, to have a great good without some danger of evil arising from it. But as, in the ordinary events of life, we do not permit a little inconvenience to stand in the way of our enjoying great happiness; so ought we not, in this case, to be deterred from pursuing our plan, even should some unforeseen calamity, which I pray God to forbid, overtake us."

"In the first instance," he says in another place, "out of door employment is generally tried; the patient is put under the especial charge of one of the servants, and set to work on the ground in such a way as to avoid any danger of his injuring himself or others. By and by, as his character becomes more known, and it is considered safe to trust him, in case of his being a mechanic, he is taken to the keeper, who has the same occupation with which he is acquainted, and is induced to work at his trade. And as there are bricklayers, joiners, tinners, blacksmiths, shoemakers, tailors, brushmakers, twinemakers, pottlemakers, basketmakers, and coopers, all at work about the institution, it is most probable that a mechanic will be able to select from amongst them some occupation with which he has been previously acquainted, or which he might like to learn; at all events, the reward of a little tea, tobacco, beer, or some other luxury, congenial to his taste, will, with a little management, generally be sufficient to induce him to occupy himself, either in his ward, or out of doors. Indeed, on an average, 454 out of the 612 are daily employed: and of the others, who are idle, some are fatuous, others in such a state of debility as to be unable to work, and only very few idle solely from disinclination to employment. The patients rise at six in the morning; at eight they assemble in the chapel for family prayers, and immediately after-

wards they breakfast; at nine they go to their work; at eleven the workers out of doors have an allowance of one third of a pint of beer; at one they dine; at four they have a similar allowance of beer; and at seven they sup."

But we need not go to other countries to discover the effects of well adapted moral management on the insane. The reports, which annually emanate from the excellent officers of the Friends' Asylum near Frankford; the Asylum for the Insane Poor in Vermont; the M'Lean Asylum at Charlestown; the Asylum for Poor Lunatics at Worcester, Massachusetts, and others, sufficiently testify to the interesting fact, that however perverted may be the reasoning powers, there are but few who are unsusceptible of appropriate appeals when judiciously employed. Who, indeed, would have credited—fifty years ago—the testimony afforded us in the reports above referred to, that numbers have attended public worship in the chapels of the institutions, and conducted themselves with the greatest decorum, who in the halls were noisy, talkative and profane!

"Can we contemplate," says Dr. Woodward, the intelligent superintendent of the asylum at Worcester, Massachusetts, "a more interesting spectacle than the assembly of the insane, a large proportion of whom had been incarcerated for years in prisons and in dungeons, or confined with chains and manacles, the objects of terror and dread to all around them, convened on the Sabbath for public worship, all decently clad, and respectable in appearance, calm, and self-possessed, listening with apparent attention to the messages of truth, uniting in the devotions, and joining in the songs of praise, all going and returning from the chapel with order and decorum? Such a spectacle we have witnessed on each returning Sabbath since our chapel was consecrated. Who can longer doubt that Christianity brings its consolations to the insane as well as to the rational mind?"

For these salutary reforms in the moral management of insanity, we are mainly indebted to a learned French physician, who, less than fifty years ago, had the hardihood to oppose the revolting management at that time universally in use in the insane institutions of Paris, and whose boldness, judgment, and philanthropy were crowned with a degree of success which must have been as gratifying as it was astonishing to him.

In a work recently published, and now before us, M. Scipion Pinel, the son of the great reformer, has given the details of the experiment, which, as he properly remarks, is celebrated in the annals of science. In the latter months of the year 1792, Pinel, who had been for some time chief physician to the Bicêtre, begged repeatedly of the public authorities, to permit him to remove the chains from the furious. His applications having been unsuccessful, he presented himself before the commune of Paris, and, repeating his objections with increased warmth, urged a reform of such monstrous treatment.

"Citizen," said one of the members to him, "I will go to-morrow to visit the Bicêtre: but wo betide thee, if thou deceivest us, and if thou concealest any of the enemies of the people amongst thy insane."

This member of the commune was Couthon. The next day he went to the Bicêtre. Couthon was himself, perhaps, as strange a spectacle as any whom he visited. Deprived of the use of his lower extremities, and compelled to be borne on the arms of others, he appeared, says Pinel, a fraction of humanity implanted on another's body; and from out of his deformity, pronounced in a feeble and feminine voice, merciless sentences proceeded—sentences of death; for death was the only logic that then prevailed. Couthon visited the insane in succession and questioned them himself, but he received only imprecations, amidst the clanking of chains on floors disgustingly filthy from the evacuations of the miserable occupants.

Fatigued with the monotony and revolting character of this spectacle, Couthon returned to Pinel. "Citizen," said he to Pinel, "art thou thyself mad to desire to unchain such animals?"

"Citizen," replied Pinel, "I am convinced that these lunatics are only intractable from being deprived of air and liberty, and I expect much from a different course."

"Well," said Couthon, "do as thou likest. I leave them to thee. But I am afraid thou wilt fall a victim to thy presumption."

Master of his own actions, Pinel commenced his undertaking on the very day, fully aware of all its real difficulties; for it regarded the setting at liberty about fifty furious maniacs, without injurious or dangerous consequences resulting to the other peaceable inmates of the establishment. He determined to unchain no more than twelve at the first trial, and the only precaution he took was to have an equal number of strait jackets prepared, made of strong linen with long sleeves, which could be tied behind the back of the maniac, should it become necessary to restrict him from committing acts of violence.

The first person to whom Pinel addressed himself had been a resident for the longest period in this abode of misery. He was an English captain, whose history was unknown, and who had been chained there for forty years. He was looked upon as the most terrible of all the insane; his attendants always approached him with circumspection, for, in a paroxysm of fury, he had struck one of the servants on the head with his manacles, and killed him on the spot. He was confined with more rigour than many of the others, which circumstance, combined with almost total neglect on the part of the keepers, had exasperated a disposition naturally furious.

Pinel entered his cell alone, and approached him calmly. "Captain," said he, "if I were to remove your chains, and to give you liberty to walk in the court, would you promise me to be rational and to do harm to no one?"

"I promise thee. But thou mockest me. They, as well as thyself, are too much afraid of me."

"Assuredly not. I have no fear: for I have six men at hand to make me respected, should it be necessary. But believe my word: be confiding and docile. I will give you liberty, if you will allow me to substitute this strait waistcoat for your ponderous chains."

The captain yielded with a good grace to every thing required of him; shrugging his shoulders, however, but without uttering a word. In a few minutes his irons were completely removed, and Pinel withdrew, leaving the door of the cell open. Several times the maniac raised himself from his seat, but fell again; he had kept the sitting posture so long that he had lost the use of his legs; at length, in about a quarter of an hour, and after repeated attempts, he succeeded in retaining his equilibrium, and from the depth of his dark cell advanced staggering towards the door. His first action was to look at the sky, and to exclaim in ecstasy. "How beautiful!" Through the whole day he ran about, ascending and descending the stairs, and constantly repeating the exclamation, "How beautiful! how good!" In the evening he returned to his cell, slept tranquilly on a better bed, which had been provided for him, and during the two additional years which he passed in the Bicêtre he had no paroxysm of fury. He rendered himself, indeed, useful in the establishment, by exerting a certain degree of authority over the patients, whom he governed after his own fashion, and over whom he elected himself a kind of superintendent.

But the case of Chevingé—a soldier of the French guards—is looked upon as one of the most memorable feats of that interesting and eventful day. Whilst in the service he had but one fault—drunkenness;—and when in this state he became turbulent, violent, and the more dangerous from his strength being prodigious. Owing to his repeated excesses he was dismissed from his regiment, and soon dissipated his limited resources. Shame and misery subsequently plunged him into such a state of depression, that his intellect became disordered. In his delirium he thought he had been made a general; beat those who did not admit his rank and quality, and in consequence of a violent disturbance thus originating, he was taken to the Bicêtre, labouring under the most furious excitement. He had been confined, chained, for ten years, and with more severity than most of his fellow sufferers, as he had frequently broken asunder his irons by the sole strength of his hands. On one occasion, when he obtained momentary liberty in this manner, he set at defiance the united efforts of all his keepers to make him re-enter his cell. His strength had, indeed, become proverbial at the Bicêtre.

Pinel, on several visits, had discovered in Chevingé an excellent disposition, masked by the excitement incessantly occasioned by cruel treatment. He promised the lunatic to speedily ameliorate his condition, and this promise itself rendered him more tranquil. Pinel at length told him he should be no longer chained; "and to prove the confidence I have in thee," said he, "and that I regard

thee as a man adapted for doing good, thou shalt aid me in freeing those unfortunates, who have not their reason like thee; and if thou conductest thyself as I have reason to hope, I will take thee into my service, and thou shalt never quit me."

"Never," says M. Scipion Pinel, "in the whole history of the human intellect, was there a more sudden and complete revolution: the keepers themselves were impressed with respect and astonishment at the spectacle which Chevigné afforded." Scarcely was he liberated, when he was seen anticipating, attentive to, and following with his eye, every motion of Pinel; executing his orders with skill and promptitude, addressing words of reason and kindness to the insane, on the level of whom he had been but a short time previously.

This man, whom chains had kept degraded during the best years of his life, and who would, doubtless, have spent the remainder of his existence in the same wretched condition, became afterwards a model of good conduct and gratitude. Often, in the difficult times of the revolution, he saved the life of Pinel, and on one occasion rescued him from a band of miscreants who were conducting him to the "Lanterne," owing to his having been an elector of 1789. During the time of famine, he left the Bicêtre every morning, and returned with supplies of provisions which gold could not at that time procure. His whole life was one of perpetual devotion to his liberator.

In the course of a few days the shackles were removed from fifty-three lunatics. An unexpected improvement followed from a course previously regarded impracticable and even fatal. The furious madmen, who monthly destroyed hundreds of wooden utensils, renounced their habits of violence; others, who tore their clothes, and rioted in filth and nudity, became clean and decent; tranquillity and harmony succeeded to tumult and disorder; and over the whole establishment order and good feeling reigned.

Yet, although this striking amelioration was accomplished in the metropolis of France, and has been perpetuated and increased by Esquirol and his enlightened fellow labourers; and although in our best institutions in this country a similar wise and benevolent administration exists, it is surprising, that in the provinces of France, as in the interior of the states of this Union, the influence of the example should not have been felt; or, if felt, should have been disregarded.

The extract already given from Dr. Woodward's report exhibits the afflicting truth, that chains and manacles are yet employed as means of restraint; and we have too many reasons to believe, that occasionally the wretched inmates of our almshouses are regarded as little better than the animals with which they are permitted to feed and to congregate.

Even so late as the year 1835, in France—the country of Pinel—it appears from the report of M. Ferrus on the insane, which rests on official documents transmitted to the ministers by the prefects of

police, that chains were still used in some of the country asylums; that at Meréville, in the department of the Vosges, the cages in which the furious maniacs are confined, are in cellars not raised more than a foot above the ground; these cages, made of wood, partly closed, and the remainder open so as to exhibit their interior; their dimensions four feet wide and six deep, receiving light from the openings of the corridors and cellars. Through the bars of those cages, in some of the towns, the miserable occupants receive their straw and food.

Well may we exclaim with M. Pinel, "It is undoubtedly humiliating to be compelled to offer details, which seem to belong to other ages than our own; but publicity being the best remedy for such abuses, we ought not to hesitate to point them out, until they are rectified."

As respects the *third class* of the insane, or those who are confined in the prisons and penitentiaries for safe keeping, enough has already been said. It would require cogent arguments to demonstrate, that, under such circumstances, their mental condition can be ameliorated.

Facts and arguments, similar to those adduced, have led to the establishment of extensive pauper lunatic asylums in Europe, as well as in several states of this Union. The Pauper Lunatic Asylum for the county of Middlesex, at Hanwell, of which Sir W. C. Ellis is the resident medical superintendent, is creditable, in the highest degree to the age and the philanthropy of the country to which it owes its existence. The interior is admirably arranged, and it is surrounded by gardens and cultivated grounds capable of ministering to the physical and moral improvement of the patients. The same may be said of the County Lunatic Asylum at Lancaster, the York County Lunatic Asylum at Wakefield, and others. In the one at Hanwell, the average number of patients was, in 1837, 411 $\frac{149}{365}$; in that of Lancaster, 321; and in that of Wakefield, 608.

It has been well, indeed, observed "that the utility of providing institutions expressly adapted to the insane, for the restoration of the curable, and for the comfort and improvement of the incurable, is so manifest, that we have seldom known the facts presented to a legislative assembly, without their calling forth action on the subject; and the time we trust is not far distant, when a retreat in all civilised countries will be within the reach of every subject of this distressing malady."

In this country much has been done and is yet doing. In Massachusetts there are two institutions, and the citizens of Boston have it in contemplation to establish a third expressly for the city.

The one at Charlestown is, and has been for some time, in successful operation. During the season of 1837 it was enlarged, and will now accomodate 200 patients. The institution at Worcester, Mass., was erected by the state, at an expense of upwards of 50,000 dollars, and will now accommodate 230 persons. It is a state

institution, and is principally filled with those who have committed acts of outrage, or have been adjudged by the courts to be manifestly dangerous to the peace and safety of the community to be at large. All that was contemplated by the state was to put such persons in a place of comparative comfort and security; yet even of these, it would appear from the report of the superintendent, eighty-nine per cent. of cases of less than one year's duration, and more than twenty-five per cent. of old cases have been cured. Both of these are, as the committee of the Legislature of Connecticut remark, "magnificent establishments, and do honour to the state and their founders."

In Maine, the walls of an asylum were partially erected last season on the banks of the Kennebeck, in sight of the State House at Augusta. Thirty-six thousand seven hundred and fifty-five dollars have been expended; and 43,244 dollars is the estimated balance necessary for finishing the building, of which sum 29,500 dollars were appropriated by the legislature at their last session; and it was expected that the walls would be finished, and the roof on, in the autumn of 1838, and that the building will be ready for the reception of patients in the summer or autumn of 1839.

In New Hampshire, energetic measures have been taken to establish an asylum, and at the last meeting of the legislature a bill was reported and passed, one of the leading features of which is, that the state shall subscribe thirty shares of bank stock.

In Vermont a capacious asylum exists on an extensive scale, to which large appropriations have been made by the state. From the first report, submitted to the legislature in October, 1837, it appears, that the number of patients at that time was thirty-four.

The Legislature of Connecticut, as has been before remarked, have the subject before them, and they will doubtless determine not to be behind their neighbours in the race of utility.

New York has made most liberal provision for her insane. The legislature of the state formerly appropriated 10,000 dollars annually for twenty years, for the support of the Asylum for Poor Lunatics at Bloomingdale, near the city of New York. The time is now expired; and the legislature a year ago appropriated 60,000 dollars for the erection of a similar institution in the neighbourhood of Utica. A farm of 120 acres has been purchased in a good state of cultivation and productivenes. Preparations are making for building, and plans have been designed for the accommodation of about 1000 inmates. In addition to these, the city of New York is erecting an extensive asylum for the insane of the city on Blackwell's Island, which, it was supposed, would be so far finished, during the summer of 1838, as to admit of being occupied.

In the Bloomingdale Asylum, 254 patients were treated during the year 1837.

New Jersey likewise is alive to the importance of such an institution, and at the last meeting of the State Medical Society, an address

was made in favour of the measure, and a committee appointed to report at the next meeting.

Virginia possesses two lunatic hospitals, the one situate at Williamsburg, in Eastern Virginia, the other at Staunton, in the Western portion of the state; both have received the anxious attention and aid of the legislature, and at the last session, each obtained appropriations of 30,000 dollars.

South Carolina has expended 100,000 dollars for the erection of a State Asylum at Columbia, and is now making large additions to it. Tennessee has recently erected an asylum at Nashville. Kentucky has hers, on which she has expended 30,000 dollars. The Legislature of Ohio has appropriated 40,000 dollars for erecting an institution at Columbus, which, according to the recent message of the Governor, is in readiness for the reception of patients, and from the numerous applications will not be sufficient for the wants of the state. When finished it will contain 153 rooms, and accommodate 120 patients. Lastly, the Legislative Council of Upper Canada, impressed with the necessity for action, and with the energy that has characterised the philanthropic exertions of many of the states of this Union, to which honourable testimony is borne in the report of their committee, is using active exertions to erect a lunatic asylum in the province.

And what part has this commonwealth, proverbial for her admirable institutions of a charitable nature, taken in this noble career? As yet nothing. She contributed, it is true, towards the erection of the Pennsylvania Hospital; but this valuable charity cannot receive more than 39 poor lunatics; and has, at present, from all parts of the state, but 33, of whom 23 are permanent residents. The new cases are received on trial, and if, after six months, no improvement occurs, their friends are requested to remove them. Even when the new establishment is opened on the western side of the Schuylkill, it is presumed that not more than 50 poor insane persons can be received into it. The time has come, however, when Pennsylvania will arouse her dormant energies, and with her extensive population and territory, and her ample resources, will exhibit that decision which has characterised her in the adoption of every feasible plan for the promotion of the happiness and the amelioration of her citizens. Nor will the contemplated undertaking, except at its commencement, be onerous or expensive. It has been already shown that there are but few insane who cannot be profitably employed in useful, and, we may add, in productive labour. In their present condition, they have to be supported by the community at a higher expense than would be needed in a proper establishment; no facilities are afforded them for appropriate labour, and their maintenance has to be wholly drawn from the district in which relief is extended to them. Add to these considerations, that so many of the recent cases—90 per cent.—are restored, and taking the average of cases 41 per cent., and it will be manifest that the saving in such an asylum might be immense: not only

may the lunatic himself be soon able to quit the institution, but if he be the head of a family, he may thus prevent *them* also from becoming burthensome to the public.

In the county almshouses, it has been shown, no such chance of restoration exists, and evils become perpetuated, which, under other influences, might easily have been rectified.

"By the steward's memoranda," say the trustees of the State Lunatic Hospital at Worcester, Massachusetts, in their fifth annual report, made in Dec. 1837, "it appears that the avails of male labour supplied by the institution, with the aid only of one farmer employed to superintend it, has, at a moderate estimate of the value of the several products, amounted, during the past year, *to more than eleven thousand dollars*. This amount will undoubtedly be increased another year, since we have many more labourers than sufficient to cultivate our land. In addition to the labour employed in farming and gardening, the patients cut and secure all the wood used in the establishment, amounting to more than 400 cords in the year; attend to the barns, stables, and piggeries; perform much of the hard work in washing, and do a great variety of other work about the establishment.

"During the last year we have erected a building containing a shoemaker's shop and a carpenter's shop. In the former we expect hereafter to be able to manufacture and repair all the shoes necessary to supply the hospital, and in the latter to perform much of the work requisite to keep the buildings and furniture in repair. There are some good mechanics amongst our incurable as was as curable patients, and others are capable of being made so notwithstanding their insanity.

"Thus we are enabled to combine profit to the institution with the best and most successful means of cure and enjoyment to its inmates."

The testimony of the steward of the M'Lean Asylum, in his report for the year 1836, is of an analogous nature. After remarking, that in the Labour Department, seventy-seven of the males had been engaged in manual labour, and worked six hours a day—more than which no patient was asked to work—he adds, "Nor has our labour resulted in mere amusement, as the harvest of our crops abundantly testifies. Our farms and lands, inclusive of all the grounds occupied by the buildings and courts, consist of twenty-five acres. We have raised, for the most part, vegetables enough of every kind to supply the institution for the year, and have cut hay sufficient to keep five horses and six cows, besides storing eighty barrels of apples and fifty bushels of pears. We have also made rosewater enough for medicinal and culinary purposes and disposed of fifteen dollars worth. The nett profits of our farm and garden for the past year have been $500.

"Fifty patients have worked in the carpenter's shop at six hours per day, and have been employed 1151 days; and made 7236 boxes, which have been sold for $907 06."

He adds, that it was then sixteen months since a "Sewing Society" had been established amongst the female lunatics, and the avails of their work had been, in cash, $112 96.

Such being the facts in regard to the condition of the insane in this commonwealth, can farther arguments be needed to point out the necessity of an establishment of the kind that is contemplated? Shall we be content with inglorious inactivity, whilst our brethren elsewhere are sedulously employed in their endeavours to restore to mental existence those who are afflicted with the most awful of dispensations, and generally from no fault of their own? Can we remain satisfied with their condition at home in their own miserable hovels, or with banishing them from our sight to be immured in institutions, where but imperfect attempts at restoration are practicable, and where they are merely kept from inflicting injury upon themselves or others, with the moral certainty, in too many of the cases, that hallucinations, which, under other management, might have been wholly removed, must become more and more firmly implanted, until ultimately the wretched maniac sinks prematurely under his excitement, or subsides into a state of incurable melancholy or fatuity? or can we hesitate to exert all our energies to diminish evils of heart-rending extent, and to adopt measures—so eminently within our reach—for restoring the miserable lunatic to his relatives and to his country; or of ameliorating and softening his condition when perfect recovery is impracticable?

Satisfied that only one feeling can prevail upon this deeply interesting and momentous subject, it is but necessary, perhaps, to urge the importance of *speedy* action,—if not on the ground, that already much precious time has been suffered to pass by unimproved, for the overwhelming reason, that every year's delay removes the chance of restoration from hundreds of our fellow creatures, whose reason is, as it were, in our keeping, and lays the foundation of evils which may descend to all future ages.

ON

SPERMATOCELE,

OR

VARIOCELE OF THE SPERMATIC CORD.[1]

BY SIR ASTLEY COOPER, Bart. F. R. S. D. C. L.

SERGEANT-SURGEON TO THE QUEEN, AND CONSULTING SURGEON OF GUY'S HOSPITAL.

By the above-mentioned terms, I mean to express an enlargement and alteration of structure in the spermatic veins. It is of frequent occurrence, but is sometimes only a slight inconvenience: in other instances, it produces a great deal of local suffering and of mental depression.

Although the veins are generally larger than the arteries in the various structures of the body, yet it appears that the disproportion between them is greater in the spermatic cord and testis than in other organs.

In the erect position of the body they become extremely distended with blood; but in the recumbent posture are comparatively empty; so that they undergo great changes in their bulk from alterations in position, being influenced by the following circumstances:—

1. The height of the column of blood leads to their great distension; for although they possess numerous valves, yet the free lateral communication which exists between them by anastomosing branches, allows the blood to retrograde to the testis through these communicating channels, and to gravitate with force upon the vessels.

2. Under an increase in their diameters, the edges of the valves no longer meet, and the blood descends between them; so that they only partially perform their natural office so long as the enlargement of the veins continues.

3. Relaxation, produced by age or by a warm climate, not only has the effect of relaxing the scrotum, but the veins of the spermatic cord also lose their support from the surrounding parts; and thus is this complaint produced and continued.

4. Clothes worn tight around the abdomen have the effect, by their pressure, of preventing the free return of blood into the inferior cava, from the spermatic veins.

[1] Guy's Hospital Reports, No. vi. p. 1.

The belt also, with which it has been so much the custom to encircle the abdomen, has a strong tendency to produce this effect, as well as, by its pressure upon the abdominal viscera, to force them from their proper cavity; and thus to produce a spermatocele on the one hand, and a hernia on the other; although the belt is sometimes absurdly recommended to prevent both these effects.

5. Corpulency has a similiar tendency to produce spermatocele; for the accumulation of adeps in the omentum and mesentery adds to the pressure upon the returning veins, and leads to the excessive distension of those vessels.

Spermatocele—as every surgeon knows, who is the least familiar with this disease—occurs more frequently in the left than in the right spermatic cord; yet I have several times seen it on the right side; and have a good preparation of it.

The reasons which may be assigned for its greater frequency on the left side, are,

1st, The left testis hangs, in general, lower than the right; and, consequently, the column of blood returning from it is higher than that of the right, and the blood gravitates more powerfully in the erect position of the body.

2dly, The left spermatic vein terminates in the left renal vein, at nearly a right angle to the course of the blood in the two vessels; by which the stream of blood in the spermatic vein is somewhat interrupted, or the freedom of the flow diminished: and the constant operation of this cause produces distension and enlargement of the spermatic vein.

3dly, The renal vein terminates at nearly a right angle with the stream of blood in the inferior cava; and thus a second impediment to the return of the blood is produced from the left testis, whilst the spermatic vein on the right side forms no angles in its course to the vena cava inferior.

4thly, The left renal vein is much exposed to the pressure of the viscera as it crosses the fore-part of the aorta.

That these circumstances do operate to produce spermatocele is proved by its occurrence in the female, in whom it also happens on the left side; and the ovaria being upon the same level, or nearly so, there does not exist a higher column on the left side to produce the effect: yet I have never seen this disease in the female but on the left side; although I do not mean to deny altogether the possibility of its occurring on the right.

Spermatocele produces a pyriform swelling of the spermatic cord; unless it be very pendulous, when it forms a double cone with the testis near the middle; and it may be traced in the inguinal canal, to the upper ring, and even into the abdomen, in relaxed abdominal rings.

The sensation which it gives to the fingers on manipulation, is, that tortuous cords, or small twisted ropes, are contained in the swelling; and the fingers sink between these cords, and meet between them at the back of the scrotum.

In some persons whose skin is thin and delicate, the complaint assumes a bluish appearance; for the colour of the blood appears through the scrotum.

In all persons, it diminishes in the recumbent, and increases in the erect position; and it is lessened by cold, and increased by heat.

In those cases in which the swelling extends into the inguinal canal, it becomes influenced by the action of the abdominal muscles; and coughing or straining produces a sudden increase of the swelling, so as to give it, in that act, a resemblance to hernia, by forcing the blood backwards into the veins.

The testis, in spermatocele, is generally soft and relaxed; and it is somewhat smaller than the other. It also does not fall, as it naturally does, to the bottom of the scrotum, but is suspended about midway between the external ring and the bottom of the scrotum. It hangs anteriorly to the spermatic cord, with what appears like a bundle of twisted and knotted ropes above and below it, reaching to the bottom of the scrotum.

In some persons it is discovered accidentally; but in others, a sense of weight, and feeling of uneasiness in the course of the spermatic cord, lead to a knowledge of its existence by inducing a careful examination of the part.

It sometimes produces a sense of depression in the stomach, and disturbs the digestive process, and thus becomes a great source of annoyance; also, much pain, weight, and uneasiness are produced in the loins.

In some persons the disease occasions a mental depression. The patient believes himself bereft of his virile power; and this impression, with the pain he feels in the part and in the loins, with the weakened powers of digestion, and the influence this produces on the nervous system, leads him to seek assistance which he has not been able to obtain; and he is ready to accede to any proposal for his relief.

In general, however, this complaint produces little inconvenience, and is scarcely heeded by the patient in the greater proportion of cases: and it ought not to depress his spirits, nor is there cause for apprehension, either for the present or for the future.

When spermatocele is dissected, the spermatic veins are found dilated and elongated, and more tortuous than they naturally are: their coats are exceedingly thickened, and they appear to be much more numerous than before the formation of the disease; although this appearance arises only from the increase of the smaller vessels, and not from the production of additional vessels. From the thickening of their coats, the veins appear as arteries when they are cut across; for they remain patulous.

If quicksilver be poured into the vein, at its termination in the renal, it at once descends to the testis, with scarcely any interruption; and the veins can be injected with wax, in a direction contrary to the course of their blood.

From the increase of their diameters, and the valves no longer meeting at their edges, the whole of the blood in the spermatic vein forms a very high perpendicular column, and has a constant tendency to increase the disease.

From their elongation, they become unnaturally tortuous; for they grow in length as well as in diameter.

As this complaint in many respects resembles hernia, and has often led to the improper application of a spring truss, it is necessary to point out the distinction between the two diseases: for the application of a truss not only produces no advantage, but it is, on the contrary, productive of great injury, and increases the complaint, by preventing the return of blood through the veins. However, the mistakes to which I have alluded are very liable to happen, from some of the symptoms being similar in the two diseases.

Like hernia, this complaint begins in the course of the spermatic cord, or at least appears in that course. Like hernia, it increases in the erect, and subsides in the recumbent posture. Like hernia, when it occupies the inguinal canal, it dilates in coughing. Like hernia, it increases by pressure on the abdomen; and, like hernia, it fills from the abdomen when it has been emptied.

But it is unlike hernia, from the irregularity of its surface, and from the feel of tortuous and knotted cords in the swelling: it is unlike intestinal hernia, in the absence of the gurgling noise which attends the return of the intestine into the cavity of the abdomen; and it is unlike the same hernia, in its not inducing an interruption to the passage of the bowels.

But the best discriminating marks are the following:—The patient is desired to place himself in the recumbent posture: then the surgeon presses upon the spermatic cord, and raises the testis and swelling, and it disappears: he then places his fingers at the external abdominal ring, and directs the patient to rise; and if the swelling be varicose, it immediately re-appears; but if it have been hernia, it cannot re-appear. Even pressure at the abdominal ring, without the patient returning to the erect position, will reproduce the swelling of the spermatic veins, by preventing the free return of the blood; but the pressure must not be sufficient to arrest the blood in the spermatic artery, or the veins will remain empty.

Spermatocele might be confounded with congenital hydrocele; as it also fills in the erect, and disappears in the recumbent posture: but the transparency of this hydrocele will lead to a sufficient diagnosis.

OF THE TREATMENT OF SPERMATOCELE.

The applications for a remedy in this complaint are numerous and frequent, and would be abundantly more so, but for the general conviction of the hopelessness of relief.

In general, it is only an inconvenience to the patient; and the plan of treatment consists in supporting the part: and this is effected

by applying a suspensory sling, with two tapes sufficiently long to encircle the abdomen. The sling receives the scrotum and testis; and the tapes, passed around the abdomen, and tied in front, secure the parts in an elevated position. No straps should be placed beneath to pass between the thighs; as they draw back, rather than elevate the scrotum and swelling.

As the parts should be kept as cool as possible, the material of the sling should be an open *silk net*, which allows the escape of heat, and prevents a relaxing perspiration. From this support the patient derives great relief; and the application of an evaporating lotion of spirits of wine and water relieves him still more. A very good lotion for this purpose consists of alumnis ʒi. aquæ ʒxi. spiritus vini ʒi.: but the lotion should be as much as possible devoid of smell, as it leads to the suspicion of some infirmity.

Washing two or three times a day with cold water, with salt dissolved in it, is useful; and the employment of the shower bath, by constringing the scrotum, prevents the increase of the complaint.

The dress should be as light as possible, to prevent the production of superfluous heat, and to permit its escape; and all tight dress around the abdomen is to be avoided, to allow of the free return of the venous blood from the testis. Still, however, these means leave the patient with the badge of his infirmity, from his continuing to wear his bandage; and attempts have been made to relieve him by exciting inflammation and thickening of the scrotum, and thus to render it a better support to the testes. I have applied the pyroligneous acid for this purpose; but the pain which it excited was severe, and the good effect only temporary. I have also employed blisters with the same view and with the same effect.

It has been advised to draw the scrotum through a ring, and fix it there, the person continuing to wear it; but, as it may be readily believed, this has no advantage over the use of the sling support, and is a much greater annoyance to the patient's feelings, either than the disease itself, or the bandage which he is usually called upon to wear.

Yet there are cases in which this complaint produces so much pain of body and mental distress, as to render it absolutely necessary to do something more than is generally advised. The patient has constant pain, and a feeling of weight in the scrotum, which leads him to support it with his hand, and frequently to change the position of the parts. He suffers much in exercise, both in riding and walking; and he has pain in the course of the spermatic cord, and in the loins on that side. He has a sinking sensation at his stomach; his mind is never free from anxiety and depression, from a belief that his powers are diminished; and his life is rendered miserable. The complaint is no longer a simple inconvenience, but is a source of constant annoyance, and he most eagerly seeks some mode of relief. In such severe cases, the patient is sometimes anxious for the removal of the testis, as he does not regard the pain

of an operation, when contrasted with the constant uneasiness which he suffers. Of this I will give the following case, from an operation on a patient in Guy's Hospital, performed by Mr. Key.

"T. H., aged 18 years, was admitted into Guy's Hospital, under my care, in June 1826, for an enlargement of the veins of the spermatic cord, accompanied with considerable pain.

"About three years ago, whilst he was in the act of mounting a horse, the animal sprang forward, and on his descent upon the saddle, the left testicle was much bruised, and produced, for a few minutes, excruciating pain. In a fortnight, the effects of the accident had nearly subsided; but from this time he remarked that the testicle felt softer than the other, and occasionally gave him pain along the cord; and he also imagined that the gland gradually wasted. Till within the last six months, it did not give him much inconvenience; but latterly it has begun to swell, and has become more painful when he has been engaged in any active employment. The part now presents an irregular knotty swelling at the superior and back part of the testis, extending some way up the cord; and it conveys to the hand the impression of a bundle of cords, with knots tied in them. The testicle is soft, and not so large as the other, and gives when handled. The pain is chiefly referred to the loins.

"The swelling in the veins has the usual characters of hernia; dilating upon coughing, and increasing in the erect position of the body.

"At his earnest request, the operation of removing the testicle was performed, after the ineffectual application of sedative local remedies, leeches, and a continued horizontal posture, with alterative medicines. It was at one time suggested that a ligature on the spermatic vein might succeed in curing the varicocele; but the natural irritability of the patient's constitution forbade such an operation.

"Charles Aston Key."

Although the foregoing is a most severe case, and of rare occurrence in so aggravated a degree, yet I have seen, in the course of my practice, many persons suffer so severely in body and in mind from this complaint, that they would readily submit to any operation which was not attended with danger to life, to obtain relief. As to tying the veins of the spermatic cord—from what I have seen of the dangerous and destructive effect of exciting inflammation in veins—I should never propose it; nor do I think, if it were not dangerous, that it is founded on proper principles. But, in my work on the testis, published in the year 1830, I have advised the removal of a portion of the scrotum in the following words:—

"The removal of a portion of the scrotum will lead to a diminution of the veins of the spermatic cord; and it is an operation, in

an extreme enlargement accompanied with pain, which might be tried with perfect safety, and is very likely to succeed."

I had, at that time, never performed the operation, and I therefore spoke of the probability of success only: but, aware of its being free from danger, and seeing that it would render the remaining portion of the scrotum a natural bandage, and that a great degree of relaxation of the scrotum also attended this complaint, and that such relaxed portion might be safely and effectually removed, I determined to take some opportunity of performing the operation.

Beside the advantage of making the scrotum, in its lessened state, a means of support, it must naturally occur, that the adhesion, excited by the operation of the fascia, which covers the cremaster, to the surrounding parts, would produce a permanent support, and render a suspensory bandage unnecessary. It might be thought a painful operation; but it is not so, nor does it excite constitutional irritation.

The mode of performing it is as follows:—The patient being placed in the recumbent posture, the relaxed scrotum is drawn between the fingers; the testis is to be raised to the external ring by an assistant; and then the portion of the scrotum is removed by the knife or knife-scissors;—but I prefer the former. Any artery of the scrotum which bleeds is to be tied; and a suture is then made, to bring the edges of the diminished scrotum together. The patient should be kept for a few hours in the recumbent posture, to prevent any tendency to bleeding; and then a suspensory bag is to be applied, to press the testis upwards, and to glue the scrotum to the surface.

The only difficulty in the operation of removing the scrotum by excision, is in ascertaining the proper quantity to be removed; but it adds but little to the pain if a second portion be taken away, if the first does not make sufficient pressure on the spermatic cord. It is of no use to remove a small portion of the scrotum, for from doing this I have failed. When the wound has healed, the varicocele is lessened, but not always entirely removed; but the pain and distressing sensations cease, if sufficient of the scrotum be removed.

In making the suture in the scrotum, its lower part is to be brought up towards the abdominal ring, to raise and support the testis; as does the suspensory sling when it is worn.

CASES.

Case 1.—Mr. Rees, surgeon, of Blackfriars Road, sent me a patient of his, who had a large varicocele on the left side, with a very relaxed scrotum. He suffered severely from uneasiness in the spermatic cord and in the loins, a sense of weight and oppression in the region of the stomach, and excessive mental depression. On the 18th of February, 1831, I removed a large portion of the scrotum, and exposed the fascia covering the cremaster, and the testis in its envelopes. By three sutures, the edges of the scrotum were

approximated, and the wound quickly healed, and he, on the 3d of March afterwards, quitted London. Through the kindness of Mr. Rees and Mr. Webster, I have received the following account of the result of the operation :—

"Dear Sir—The gentleman on whom you operated was 32 years of age. The portion of the scrotum removed, when extended, measured four inches in length, and in breadth, in the middle, two inches and a half. He left London perfectly well, and I have sent you his address.

"I am your obedient servant,

"John Rees.

"240, Blackfriars Road."

From Mr. Webster I have since learned the following particulars:—

"The gentleman is able to ride fifty miles a day, without inconvenience; although, before the operation, he could not continue on horseback more than two or three miles: and in a letter which Mr. Rees has received from him, he expresses himself in the highest terms of gratitude for his recovery."

Case 2.—Mr. S——, aged 20, has had a spermatocele three years and a half, attended with a great sense of uneasiness in the part, and a dull, heavy pain in the spermatic cord and loin on that side. My assistant, Mr. Balderson, held the scrotum between his fingers, and I removed all that could be easily elevated from the testis and its coverings, which are necessarily exposed in the operation. I then brought the integuments together by sutures, so as to close the wound completely; but I previously secured some small bleeding arteries. He was ordered to keep himself cool, and to remain in the recumbent posture; and the part was placed in a suspensory sling: however, the next morning he went down to breakfast; but this imprudence did not prevent his quick recovery from the operation, with the result of which he was highly pleased. The varicose veins are greatly reduced: the coverings of the testis adhere to the upper part of the scrotum. He soon gave up the use of the sling support; and lost the pain in the spermatic cord and loins, which he had previously sustained.

Case 3.—H. B., aged 18 years, had a spermatocele upon the left side, from the age of fourteen. At fifteen he fell across an iron bar, which greatly hurt him; and he thought the complaint had quickly increased after that time. He suffered much from pain in the testis, more especially in walking, and from uneasiness in the groin, spermatic cord, and the spinous process of the ilium and loins. He consulted several medical men, who told him his complaint was a hernia. But he was then recommended to Mr. Taunton, in Hatton Garden, who informed him it was a varicocele: and the scrotum was directed to be supported, and an evaporating lotion to be used.

On July 20, 1837, I removed a large portion of the relaxed scrotum which covered the swelling, in the presence of Mr. James Babington; secured some small arteries, and then used four sutures to approximate the edges of the scrotum. He was sent from my house, in a coach, to Chelsea, after the operation; and the scrotum very soon healed, and the uneasy sensation in the part vanished.

Case 4.—Mr. John K——, aged 25, four months ago found the scrotum enlarged on the left side, with occasional pain in the part, which darted upwards to the external abdominal ring. It gradually increased, until it was three times larger than the right side of the scrotum, became more painful, and occasioned much depression of spirits. On the 15th of October, 1837, I removed a portion of the scrotum by passing a needle and thread through it in three different places, and cutting away the scrotum beyond them. This plan did not facilitate the operation, and made the tying of the arteries more difficult; but it succeeded in relieving the disease.

I am obliged to Mr. Key for sending me the following case.

"In the autumn of 1837, a young man, aged 18, suffering much from a painful varicocele, applied to me, to know if I would advise him to submit to the operation of tying the veins, which had been recommended by a surgeon. The varicocele, which was on the left side, was large, and more than usually pendulous; the veins forming a large festoon, that could be distinctly felt through the scrotum. I explained to him the risk and inefficacy of an operation on the veins, and also the simple operation which you had practised for the cure of varicocele. The pain that he experienced in following his occupation induced him, at once, to have the operation performed. With the assistance of my dresser, Mr. Whitchurch, I removed about two inches of skin, so as to shorten the scrotum from above to below. The edges of the wound were secured by pins; but an oozing of blood into the cellular membrane interfered with the process of adhesion, and the whole healed by granulation. The relief which he thus obtained, since the wound closed, will induce me to have recourse in future to the operation for a painful varicocele. The support which the veins would have received if the wound had healed by adhesion would have been more effectual; and I should in another case take every precaution to ensure the adhesive process."

In one case I raised the scrotum and placed a ligature around the part which I designed to remove, drawing the thread quite tight: but it produced a great deal of pain; the part sloughed with considerable constitutional irritation, and after a great length of time, and with more suffering than the complaint justifies.

I wish it to be recollected, that I only recommend the removal of a portion of the scrotum in those cases of spermatocele in which the patient suffers great local pain; in cases in which he is most urgent to have the swelling and deformity of the part removed,

and more especially in those instances in which the function of digestion suffers, and there is a degree of nervousness and of mental depression. For slighter cases, a suspensory bandage must be still recommended.